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ANTISEPTIC INHALATIONS IN PULMONARY DISEASES.

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In the treatment of pulmonary complaints the tendency at the present time is towards local medication. This arises principally from the general acceptation of the germ theory, which teaches in the main that diseases originate from microörganisms; and the belief that from this it must follow, as a necessity, that these microörganisms must be destroyed or rendered harmless to organized tissues, either as a means of cure or as a prophylaxis to such disease. It is from the supposition that those microörganisms known as bacilli exist in the lungs in tubercular disease, and that their destruction eventually becomes necessary in order to cure the pathological condition recognized as tuberculosis, that the study of antiseptic or germicidal inhalations have for the past few years received more than usual attention. The presence of the tubercular bacillus, made renowned by Koch, has been too frequently verified by competent observers to admit of a doubt as to its reality, nor can there be much less doubt as to the dependence of the phthisical process on the presence of the bacillus. This is now acknowledged by most pathologists and bacteriologists. At the same time it has been made apparent that the bacillus can be more readily destroyed in a culture fluid than in its habitation in the lungs. In the first place because it can be reached more easily, and in the second place because antiseptics of sufficient power to kill it out of the body would, if applied to it in the lungs, jeopardize the life of the subject on whom it is found.

For these reasons attention has been directed more particularly to the study of means whereby antiseptics or germicides may be made to reach it in the lungs more directly, certainly and safely than has hitherto been known. It is no part of the object of these remarks to discuss the pathology of tubercular consumption, about which so little is known, but it may be said the state in which we find the lungs in this disease is the same we find in other destructive changes in other parts of the economy, that is to say more or less putrefactive or septic according to the amount or degree of suppuration, or the extent of the virus or poison infused. Pavy says, "It is only in the presence of the organisms in question that putrefactive decomposition occurs," and "we are bound by the evidence now before us to look upon putrefaction as the issue of the influence exerted by the living organisms to which our attention is being given." (Harveian Oration).

Antiseptic inhalations for the treatment of diseases of the lungs of course presupposes sepsis as their object and aim, and upon this ground is based the theory of antiseptic treatment. The object of antisepsis is to destroy or counteract the influence of this sepsis. Whether this sepsis is contained in the bacillus, acting as a direct poison, setting up a peculiar inflammatory process more or less purulent in character, which constitutes the whole of the disease, or in the products of this inflammatory action produced by this or other causes—these forming the medea, the culture beds, or feeding grounds, as is the case with other microörganisms under allied conditions, no one is so far advanced in these investigations to decide. There can be no doubt that the tubercular bacillus lives and multiplies under septic conditions. All microörganisms thrive best and increase more rapidly during putrefactive changes. Bacteria it is said cannot live in healthy tissues, that healthy organisms are able to resist their formation and growth, while dead tissues have no such preventive power, that bacterial growths and the destruction they cause occur mostly in the areas of stasis, where the resisting effort is far below the normal, in localities where there are distinct tissue changes, or accumulations of a character requisite for their growth and increase, that these conditions are not presented when the natural forces and vigor of the constitution are up to a healthy standard, but only when there is actually lowered vitality either from inherited tendencies or from causes accidentally acquired.

The teachings of Koch are, virtually, that the bacillus is peculiar to the lungs, and peculiar to the lungs in certain conditions of them—as in tubercular disease. That it sets up *de novo* that peculiar inflammation, that the character of the products of such inflammation differs from the products of other inflammations, and the sepsis or poison is contained in the bacillus, which never occurs spontaneously but is always found in connection with this diseased condition.

It is not germain to the subject whether some dis-

pute or reject this formula or not. A few have denied the *rationale* of the whole germ theory, regarding it as absurd or false. There are a few others who believe that microörganisms are the result of disease and not its cause, that each microörganism, bacterium, bacillus or coccus, is peculiar to the disease in which it is found, and the result of the disorganization in such disease, that they are only carriers of disease—ptomaines—which are germinated during decomposition of organic matter. There are still a few others who maintain that it is not the microörganisms themselves that are poisonous to man but the products to which they give rise, which is chemical in its character, and we are told we must now seek to discover under what conditions and from what substances various microörganisms elaborate poisonous substances and also to determine the composition of these products.

The subject is too extensive for ordinary discussion, and as the doubtful points are so much more numerous than the true and reliable ones, it is best to bide the time when it can be elaborated with more satisfaction. The fact is that so many questions have arisen since the first introduction of the recent doctrines of tuberculosis that it is absolutely confusing to one who has not given it his whole continuously undivided attention. Whatever may occur afterwards there is no doubt in phthisical disease the initiatory step in the pathological process is in the presence of the bacillus. The absorption of waste products may be the ulterior effect—this absorption poisoning and subduing the whole system under its influence, producing the rapid waste and destruction of the tissues of the body we see in the general emaciation of the subject.

Phillips, of Edinburgh, "On the Etiology of Phthisis," (read before the Section on General Medicine, International Medical Congress.—*Medical Times*, Oct. 1, 1887) asks, what then is the *modus operandi* of tubercular bacillus in leading towards death? Is it the (1) progressive asthenia, (2) loss of hæmatosis, (3) the lighting up of fresh inflammatory foci, (4) the absorption of waste products? Its fatal properties cannot I think be regarded as merely irritant or primitive. In all probability they are attributable to a power possessed by it of elaborating new products which are afterwards absorbed? Koch says we must find the microörganisms in the blood, lymph or tissues of the diseased man. We must isolate these microorganisms and cultivate them and carry on these pure cultures through successive generations to prove their identity. But in spite of all this if our antiseptic inhalations are to be of any avail we must come back to the initial stage when the bacillus first gets its lodgement and begins to work. This is the time when treatment would seem to be the more efficacious. When the virus is absorbed into the blood, lymph or tissues, by way of the lymphatics and blood-vessels, all treatment would by *a priori* reasoning appear to be useless. We cannot, must not wait for this period if we would arrest the phthisical process. That the active principle of the bacillus is a virulent poison seems to be proven by the experiments of Dr. Philip (op. cit.) with the extract of sputa obtained from phthisical patients. Among other conclusions he says, "It appears probable that the lethal influence of the bacillus is due to the production of certain poisonous products. That such a product is separable from the carefully selected and prepared sputum. That the product is possessed of well-marked physiological properties, being eminently toxic to frogs, mice, and other animals. That the toxic properties of the product are, speaking generally, depressant, and more particularly on the heart. A large majority of the profession accept the doctrines promulgated by Koch, and it is upon a clear appreciation of the points enumerated by him that our therapeutics depend. If the tubercular bacillus is a septic poison capable of rapid and destructive propagation in certain conditions of the lungs the *rationale* of the antiseptic treatment must be accepted as a *sine qua non* and unequivocally.

In a lecture by Dr. I. Burney Yeo (*Brit. Med. Jour.*, July 1, 1882) on "Antiseptic Treatment of Pulmonary Consumption," he says, "If the expectoration of the matters discharged from the air passages of phthisical patients swarm with infective microörganisms as we are assured on the highest authority is the case, if the active invading area of the diseased portion of the lung be crowded with these same infective bacilli, what treatment can be more rational and more appropriate than that which aims at destroying the life and activity of these organisms? Indeed I might ask what treatment can be rational or appropriate which neglects to follow this indication? The only question that admits of argument in connection with the subject are these two: Are we satisfied that the presence of these infective organisms in phthisical lungs and their causal relationship with phthisis have been demonstrated? and second, Have we the means of treating this disease antiseptically—that is to say, do we possess in an appreciable form the agents which will destroy these microörganisms and avert the progress of the disease? If in phthisis, as seems most probable, we have to do primarily with a specific virus or infective organism, and secondly with an inflammatory process excited by it, our treatment must have a two-fold object—the destruction of the virulent agent, and the reduction of the accompanying inflammation, and in actual practice my own experience certainly shows that the best results follow the combination in treatment of these two ends." And "I know of no disease in which so many various indications arise during its progress. But if pulmonary phthisis be pulmonary tuberculosis, and if tuberculosis depend on the presence of infective organism in the tissues, a rational treatment of phthisis must include the administration of antiseptic agents, or the surrounding our patients with antiseptic conditions.

"The term antiseptic in fact presupposes the existence of some septic process as we now know to be caused by bacterial growths. It has long been thought possible by inhalations of creosote to limit decomposition in the expectoration, but now that the investigations of many observers have shown the constant presence of certain bacteria in phthisical diseases, the hope is that not only may antiseptic in-

halations control septic processes in dead secretions, but that they may be destructive of those microörganisms which are the root of tubercular diseases in living structures." (S. C. Smith, M.D., etc., *Brit. Med. Jour.*, Feb., 1884.)

Some practical questions arise here for consideration, the most important of which are, first, can we destroy these microörganisms in the lungs with safety to the patient? and secondly, can we reach them by methods in our possession after we have satisfied ourselves they can be destroyed?

In all investigations tending towards a solution of these problems failures seem to be due in a great measure to causes arising out of misapprehension of the nature of microörganisms—particularly as to their vitality or power of resisting destruction. It is made apparent to us that antiseptics do not act uniformly. For instance, we may kill the full-grown bacillus and yet they multiply notwithstanding. Antiseptics may destroy the parent but fail to kill the offspring. By boiling a cultivating fluid containing bacilli for hours leaves the germs, or spores, untouched, but if boiled successively at short intervals the young brood are destroyed as they appear, and their multiplying ceases (Tindall). Lex found some bacteria still moving rapidly at a temperature of 120° C. Tindall's experiments have shown that there are stages in the life of the bacteria during which they resist almost any degree of moist heat. Sanderson puts the death-point of common septic bacteria at about 110° C., or 230° F. "It has been proven," says Parkes, "that they can stand a short boiling, that they can be floated in air-bubbles through vitriol, that they can be washed with carbolic acid solution of any strength short of 5 per cent. without being killed or losing their power of multiplication. Is it likely we are capable of destroying organisms which are so retentive of their vitality? I think it is quite obvious that all evidence shows that it is impossible either to keep germs out of the body or by antiseptics to kill them."

In some experiments by Koch, in 1882, (*Practitioner*) as to the reliability of disinfectants (the spores of splenic fever were generally used) he found carbolic acid in a 5 per cent. solution only sufficient to arrest the development of spores after two days, while a 1 per cent. solution was sufficient to destroy in two minutes the bacilli themselves. A solution of 1 in 850 was sufficient to check the development of the latter. The fact was very noticeable that carbolic acid in oil or in alcoholic solutions is absolutely without effect on the bacilli and spores. The spores after 110 days, and 70 days, respectively, in a 5 per cent. solution of carbolic acid and oil, and in alcohol, were repeatedly found intact. Salicylic acid and thymal showed unsatisfactory results, and even sulphurous acid, under such favorable conditions as are not obtainable in ordinary practice, fails to destroy the whole of the minute organisms that may be present. Chloride of lime in a 5 per cent. solution was also incapable of weakening the power of the splenic-fever spores (Elliston).

There is sufficient evidence to prove that it would be exceedingly dangerous to attempt to destroy microörganisms in the lungs by the same means used for their destruction out of the body. The conditions are totally different, and unless we can change the surroundings of the organisms or possess an agent only noxious to them and entirely innoxious to the pulmonary tissue, it would be useless to try such a procedure so manifestly fraught with danger; and predicating, therefore, our knowledge upon what has already been ascertained, it would appear to be entirely unsafe with the means we now possess to destroy germs so deeply imbedded in such delicate tissues without other means, also, to protect the latter from serious injury, or the general system from its toxic result. Considering the tenacity with which microörganisms hold on to life—continue their life history—how they resist chemical actions of the most varied kind, it is no wonder that our efforts have been unsuccessful in curing diseases of which they are the integral part by ordinary antiseptic means.

But supposing we had this agent especially adapted, a safe and unfailing agent, one particularly destructive to the infective virus, and not injurious, but salutary rather to the lung tissue, do we possess the means to reach it in the terminal bronchi, air cells, or parenchyma of the pulmonary structure? From experiments and from the literature of the subject this also seems problematical.

During some remarks on pneumatic differentiation at the meeting of the American Climatological Association, held in Philadelphia, May 10–11, 1888, Dr. I. H. Platt, of Brooklyn, said he believed unfounded, two of the claims put forth by Dr. Williams and Mr. Ketchum in regard to the Cabinet, the second of which was that the spray or vapor used in conjunction with the differential process can be carried further into the air passages, or more thoroughly condensed upon them than a spray or vapor could be under normal conditions. They cannot, he said, be carried so far, for the reason that the residual air is increased and consequently the inspired air which carries the vapor or spray cannot penetrate so far. It is claimed, he said, that the vapors of medicinal substances is condensed in the lungs during the differential process by compression consequent upon the commencement of the respiratory act. This is impossible, he said, first because compression only acts to condense a saturated vapor, and the air passages cannot be saturated with the vapor of a medicinal substance; and secondly, because no greater compression is produced at the commencement of the expiration under the influence of differential pressure than under other circumstances (THE JOURNAL, May 22, 1886).

Dr. Nathan Hill Hassall (*Lancet*, May 5, 1883), "On the Comparative Inability of Antiseptic Inhalations as at present practiced in Phthisis and other Diseases of the Lungs," defined the scope of the subject of the inquiry, which was, more particularly, to test the efficiency, or otherwise, of antiseptic inhalations in the class of diseases referred to, as carried out by means of different forms of oral or oro-nasal inhalers. The substances experimented with were phenol, or carbolic acid, creosote, thymol, and iodine. It was shown that in the case of the three first named

substances more than four-fifths were still present in the sponge at the end of the inhalation, while it was proved that the iodine on coming in contact with the mucous membrane of the mouth and cheeks became rapidly converted into an iodide, in which condition its antiseptic properties were of course greatly impaired if not destroyed. He said, also, that the unrecovered portions might be at least accounted for without supposing they were inhaled, by loss in extraction from the sponges, by loss in condensation of moisture in the inhaler, or the skin of the chin or cheeks, and in the mucous membrane of the mouth and fauces of the person inhaling. He also remarked, that but little evidence has yet been adduced to prove that any of the substances employed do really make their way into the lungs in any appreciable amount and so reach the seat of the disease.

In an address by Dr. Hassall, "On Inhalation, more particularly Antiseptic Inhalations in Diseases of the Lungs," read in the Section of Medicine, British Medical Association, 1883 (*Brit. Med. Jour.*, November 3, 1883), he says: "It was with a view to obtain evidence on this point that my first endeavors were made. I continued the following arrangement in imitation, as near as I was able, of natural respiration." It consisted of a syringe of 200 inches' capacity, provided with a hollow piston with a valve attachment, a Wolff's bottle filled with water, or bulb tube filled with spirit, as the case might be, attached to the syringe; the bottle in turn was attached to the termination of the trachea of an unskinned sheep's head and neck. The nose and mouth were covered with a well-fitting *papier mâché* respirator furnished with the usual cribriform receiver and sponge. The syringe was intended to take the place of the lungs, and the Wolff's bottle to intercept any substances used which might pass from the respirator down the trachea, with a view to their subsequent determination. The syringe was capable of being worked at the rate of 250 times per hour.

The first experiment was with ½ gram, equal to about 7½ grs., of carbolic acid. After the rapid action of the syringe for an hour and a half the piston in the bottle was tested by Chandelon's very accurate and delicate process, with the result of finding in it only 0.003 gram of carbolic acid; that is to say, a mere trace. In the case of eucalyptol the faintest possible odor, only recognized with difficulty, was perceptible in the alcohol through which the air was passed. With turpentine the spirit was found to possess a decided smell of the oil, though it was obvious that the quantity actually passed was but very minute. With iodine the alcohol did not become colored in the slightest degree, nor did it furnish any evidence whatever of the presence of iodine. These quotations might be multiplied to show how difficult it is to inject vapors of medicated fluids into the air passages, and this difficulty throws additional light on our inquiries in regard to our therapeutic failures. If these vapors do not pass into the pulmonary cavity—only, indeed, to the mouth and fauces—we are naturally led to inquire into the cause of the impediment, and the answer to this inquiry would possibly be that there is some vital resisting power which has been doubtless overlooked. Physical forces are always met by physical forces, and the weaker yields to the stronger; let us see if some vital or physical forces are not the foundation for these impediments.

The atmosphere is composed, in round numbers, of 20 volumes of oxygen and 80 volumes of nitrogen, with a trace of ammoniacal gas, and 3 to 6 parts in 10,000 of its volume of carbonic acid. The height of the atmosphere is estimated at 30 to 40 miles, and its pressure equal to 10 lbs. to the square inch. The pressure upon the surface of a man of medium size is estimated to be 37,560 lbs., or more than 16 tons. This pressure is exerted equally in all directions, and the internal air has the same density as the external air, modified possibly only by the difference in temperature; but for all practical purposes they are alike. The body being immersed in this vast volume of air, by the immense pressure exercised upon it, has all its open cavities filled as a compensation to the external pressure, and this equable pressure or condensation of the atmosphere renders respiration less difficult. Were it not so there would be constant interruptions to the respiratory act, impediments either to inspiration or expiration, and consequently failure of the lungs to carry out their specific functions. Rarefied air has the same proportionate pressure of condensed air, only the pressure being reduced, and the combined apparatus employed in respiration being relieved of its accustomed weight, carries on the respiratory act with more difficulty; the difficult or more rapid respiration in this case being from two causes: first, from lessened pressure; and second, from the rarefied air, which contains less oxygen in a given quantity, and therefore requires increased respiratory acts to insure sufficient for oxygenation. If we exhaust the air around the body of a person we exhaust the air also in the air passages in proportion, because there must be equalization of pressure in both directions. The fluids then flow towards the surface, following the capillaries of the skin and integument and also the mucous membrane of the air passages.

In the respiratory act at or about the ordinary sea level we have the following kinds and quantities of air, viz.: 1, residual air; 2, reserve air; 3, tidal or ordinary breathing air; 4, complemental air. In a healthy male of medium stature the residual air which cannot be expelled from the lungs amounts to about 100 cubic inches; the reserve air, which can be expelled but which is not changed in ordinary respiration, amounts to about 100 cubic inches; the tidal air which is changed in ordinary respiration amounts to about 20 cubic inches. The complemental air which may be taken into the lungs after the completion of an ordinary act of respiration, amounts to about 110 cubic inches. Inspiration, breathing in, consists of the ordinary atmosphere; expiration, breathing out, of the expelling carbonic acid, watery vapor, a small quantity of ammonia and organic matter and a little nitrogen. Under ordinary conditions the air is the only principle absorbed by the lungs (Flint). Gases mix by the general law of diffusion without chemical action, and the force of diffusion is inversely as the square root of the density of gases (Ganot).

Can we see in all this the cause or causes of the impediment in reaching the lungs by vaporized medicaments by the ordinary means used for such purpose? Do we see a factor in atmospheric pressure which resists forces to unbalance its fundamental law of equability, in the physiological act of respiration itself, which is dependent upon this law, or in the general law of diffusion of gases, which are always regulated by fixed principle?

In ordinary respiration we see that the residual air amounts to 100 cubic inches, the reserve air to 100 cubic inches, and the tidal air only to 20 cubic inches —that is, only one-eleventh of the air in the lungs is changed at each respiratory act, about eighteen times in a minute. This seems to be necessary in order to relieve the internal pressure as gradually and little as possible. The largest part of the air, therefore, remains in the lungs, the quantity expired being soon replaced by fresh air. How is it possible then to replace this air, except by the complemental air which, by distending the chest to its full capacity by an additional 110 cubic inches, would, if long continued, embarrass respiration and cause muscular fatigue or capillary plethora. This difficulty of replacing the air contained in the lungs would seem to be a barrier to the introduction of other vapors, unless it could be so mingled as not to interfere with its due proportion or properties.

Gases are bodies whose molecules are in a constant state of repulsion, and are continually tending to occupy a greater space. Fluids, as we have said, mix by the general law of diffusion, whose force is inversely as the square root of their densities (Ganot). This law is applicable to the gases contained in the lungs. The denser the gas, by this law, the less is its power of diffusion, and the lighter the gas the greater its power of diffusion. It would therefore be necessary, in introducing vaporous substances into the lungs, to be governed by the law of diffusion of gases, which has been heretofore perhaps one of the difficulties to their introduction. Another thing to be considered is that gases are more miscible than vaporized fluids, and this must be taken into account in the calculation of the admissibility of either into the air passages. In all cases gases are preferable to vaporized fluids, and will be found nearer to the natural process, and more fitted for mingling with the air of and absorption from the pulmonary cavity.

Absorption from the respiratory surface is, of course, undoubted. Flint says: "It is now almost universally conceded that animal and vegetable emanations may be taken into the blood by the lungs and produce well-marked pathological conditions. Among the most striking proofs of the absorption of vapors by the lungs are the effects of the inhalation of ether. This passes into the blood and manifests its characteristic anæsthetic influence almost immeately. Experimenters on this subject have shown the facility with which liquids may be absorbed from the lungs and the air passages, but it must be remembered that the natural conditions are never such as to admit of this action. The normal function of the lungs is to absorb oxygen and sometimes a little nitrogen from the air; and the absorption of anything else by these surfaces is unnatural and generally deleterious."

The normal condition of the respiratory surface is moist. It is continually bathed in watery vapor, making it always in a state of supersaturation and capable of resisting further moisture. This also must be reckoned among the difficulties of penetration. The density and pressure of the atmosphere, the kinds and quantities of air in the lungs, the influence of the residual air, the reserve air and the tidal air, as also the complemental air, the law of diffusion of gases, and the degree of moisture and absorption of the respiratory surfaces, must consequently be taken into account in calculating the chances of successful pulmonary therapeutics. And therefore, some modifications will have to be made in the means employed —in the apparatus and in the medicinal substances employed—so as to adapt them to their state, and condition of vital action.

So far as the mechanical means are concerned, there does not appear to be much difference between the results of the simplest and the most complicated contrivances. The simple oro-nasal respirator has been just as successful as the close chamber of the pneumatic cabinet. Both act on the same principle, the breathing of vaporized substances, with the addition of pneumatic differentiation in the latter, which is not yet proven to be of any especial service. Its action is yet debatable, and equally trustworthy investigators take different or opposite sides in regard to its utility. There are very grave doubts whether, by exhausting the air about the patient, it exsanguinates the mucous surfaces. It would be rather probable that it produces a state of congestion; or, on the other hand, by compressing the air, it can do so, as fluids are virtually incompressible. But the most important part of the discussion is whether it can produce differentiation at all—whether it can make the air surrounding the patient and that in his lungs, the external and internal air, to differ in density. Rarefied air is the same whether in a cabinet or in high altitudes, and its breathing qualities are governed by the amount of oxygen it contains. And as rarefied air seeks a larger space, the pressure is so reduced that the fluids flow in to fill the space and make compensation for that lost, and would produce congestion if long continued.

Dr. Hosmer A. Johnson, of Chicago, in a paper read before the Association of American Physicians, June 2, 1887 (THE JOURNAL), said: "The pneumatic cabinet I consider cumbersome and expensive, with nothing especially to commend it in the treatment of pulmonary diseases." This is the general opinion.

For the purpose of diffusing antiseptic vapors through the atmosphere the patient breathes. Dr. Burney Yeo (*op. cit.*) says he has found none answer better than the simple perforated zinc respirator which he has contrived, which, he says, practically costs nothing and which, with a little instruction, a nurse can make in a few minutes; in which, he says, you have the decided gain of being able to apply the antiseptic inhalation almost continually and of almost any degree of strength. It is made by taking

a piece of perforated zinc 4 × 6 inches, cutting with a pair of strong shears one side round and the other in four flaps, bending it half oval so as to fit the nose and mouth, bending in the flaps so as to form a cage for the sponge for the antiseptic fluid.

It appears to me, says Dr. Hassall, before cited, that the most effectual and natural method which can be adopted for inhalation is by chambers, the air of which is charged with the antiseptic or other medicament which it is desirable to employ. He says the following are the conditions and principles of the construction of a true inhalation chamber: 1, the dimensions should be moderate and in some cases even small; 2, the fireplaces and all inlets and outlets closed; 3, the temperature of the room should be kept at about 19° C. (66° F.); 4, the air of the room should be somewhat humid. In regard to the means whereby the air of the chamber is to be charged with suitable medicaments it occurred to him that, if any substance possessing even a very feeble volatility at ordinary temperature were dissolved and spread over a very large surface, the amount of the substance which would become volatilized would be in proportion to the quantity taken, the extent of the surface exposed, the temperature of the chamber and the amount of moisture therein contained.

To test this point 50 grams of carbolic acid (771 grs.) were dissolved in water, two Turkish towels being saturated with the solution and exposed to the air of the room at a temperature of 22° C. (72° F.), the room also containing rather much aqueous vapor. At the end of two hours a portion of the air of the room was, by means of a large syringe, drawn through a solution of alcohol, a few drops of which, on evaporation, gave with bromine water decided evidences of the presence of carbolic acid; 13 cubic centimetres of the vapor or moisture which had settled on the windows (equal to 200 grs.) were collected and were found to contain 0.029 gram of the acid, equal to 0.447, or nearly ½ gr. After the lapse of forty-eight hours the towels were quite dry, and he was surprised to find they did not possess the slightest smell or taste of carbolic acid. One of the towels was then tested and found to contain only 0.07 gram, equal to 1.08 gr.—the whole of the acid, 771 grs., with the exception of the small quantity referred to, had disappeared. In the experiment with creasote 1.25 gram, equal to 19 grs., were taken—in one case creasote was placed on the towel without any addition, in another water was used; in a third the creasote was dissolved in alcohol. After four hours the cloths were examined. From that with the creasote only 0.91 gram was removed, from that with the creasote and water 0.41 gram, and from that with the alcohol 0 39 gram, amounts which correspond with 14.01, 4 31 and 6.01 grs. respectively. Experiments with thymol gave also analogous results.

The pneumatic cabinet, an apparatus of American origin, invented by Mr. Ketchum and first introduced by Dr. Williams, of New York, for treating diseases of the lungs by pneumatic differentiation, has been before the profession four or five years. Pneumatic differentiation, Dr. Platt says, is the process by which the air surrounding the body and that entering the lungs is rendered of different densities. There are three forms, he says, which for convenience may be described as positive, negative and alterative. The effect of residual air-pressure upon the periphery of the body is to increase the expansion of the thorax in inspiration, consequently to increase the amount of residual air. By the increased pressure in the lungs it will tend to exsanguinate them and to raise the arterial blood-pressure in the general circulation. He believes that such benefit as results from the use of the cabinet is due mainly to the reduction of congestion in the lungs by the air pressure within them, and by the increased expansion and movement of the lungs favoring their greater activity and modifying their nutrition (THE JOURNAL, May, 1886).

Some of these points made so positively are probably open to discussion. He himself combats, as before quoted, the claims put forth by Dr. Williams and Mr. Ketchum: first, that the effect of removing a slight pressure from the periphery of the body was radically different from that of increasing the pressure of the air entering the lungs; and second, that the spray or vapor used in connection with the differential process can be carried into the air passages or more thoroughly condensed upon them than a spray or vapor could be under normal conditions.

From the large amount of literature on the subject of the cabinet it cannot be said to have increased to a very material extent our facilities in treating diseases of the lungs, over even the condensed air apparatus, the ordinary hand bulb or steam nebalizer, or the common nasal or oro-nasal respirator. They all have the same object in view, but none of them, so far, have achieved the success we have been looking for, or that success which is the chief object of antiseptic inhalations.

Another mode of reaching the lungs is the method introduced by Dr. Bergeon, of Lyons, by gaseous enemata. This method, known before on the Continent, was first introduced to the profession of England and America through a communication to the *British Medical Journal* (December 18, 1886), by Dr. J. Hughes Bennett, who said Dr. Bergeon came to see him at Evian les Bains, Lake Geneva, in order to bring under his notice his new treatment of phthisis and other pulmonary diseases. He says: "When Dr. Bergeon first told me that he had discovered a new mode of treatment by which pulmonary phthisis and other pulmonary diseases, asthma, chronic bronchitis, etc., could be cured and nearly always alleviated and retarded in their evolution, I smiled internally. I have so often heard of and tried new remedies only to fall back on the old, that I was incredulous. His explanation of his treatment, however, at once dispelled this frame of mind, leaving me with the impression that he had hit upon something absolutely new and of serious import. Indeed, I felt bound to admit that he had opened out a new field in pulmonary therapeutics, and that his views deserve and must imperatively obtain serious consideration and trial."

The method of Dr. Bergeon is too well known to require its description here. It was, in brief, as ex-

plained by Dr. Bennett, to pass carbonic acid, an innocuous medium, through sulphuretted hydrogen, a powerful microbicide, obtained from the water of the Eau Bonnes of the Pyrenees, and slowly inject this into the intestines, twenty minutes being prescribed for the slow, gradual injection of 4 litres or quarts. This is well borne by the intestines, is absorbed by the intestinal venous system and rapidly exhaled by the mouth through the lungs. In two or three minutes, on applying the nose to the patient's mouth, the air emitted was found to be tainted by the sulphurous gas. Within half an hour after ceasing the injection all the gas was absorbed and expelled through the lungs and mouth, the abdomen regaining its usual shape and softness. This, Dr. Bennett said, he had repeatedly witnessed.

Dr. Bennett says Dr. Bergeon claims marvelous therapeutic effects for this medication. In more than 200 cases, although the experiments were made at Lyons, where the climate is bad, the results have been successful to a degree that has surprised and astonished him. But what is the verdict after sufficient time has elapsed to give it extensive trial—earnest, intelligent trial by the best observers in all countries? Let us examine the record even partially; from it we glean the following: In 60 cases treated (Dr. Shakespeare examining the sputa) there was no apparent reduction in number or character of the bacilli. The good effects in my hands have been reduction of temperature, reduction of expectoration, very often a complete suppression of bronchial catarrh, and relief of cough. Should the bacillus of tuberculosis be the real cause, we lack thus far a specific therapeutic remedy, and from my records it does not appear that Bergeon's method will help us much with this indication for treatment (Bruen). In about 50 per cent. the condition has been greatly ameliorated, in 25 per cent. there was slight amelioration, and in 25 per cent. there was slight amelioration. In no case was there no result (Cohen). Produced collapse in varying degrees, weak pulse, vomiting, headache. It produced no good effect. 1. Toxic symptoms may follow its use; 2, causes great abdominal discomfort; 3, is in no sense a specific (Shattuck and Jackson). Our conclusions are, that the treatmeut of phthisis by gaseous enemata has had undue value attributed to it, that it is seldom of any benefit, but that it may prove serviceable in occasional cases (Pepper). Sudden glycosuria may arise under gaseous enemata (F. Billings). The effects on the urine are that the sulphates are largely increased, and sulph. hydrogen was frequently detected in the urine in a free state; much oftener than in the mouth. The tonic action of the gas causes increased secretion from the gastro-intestinal canal and skin and is laxative, finally impairing the red blood globules, causing great anæmia, vomiting, debility, and a feeble condition (Hutchinson and Adams). The patients treated with air did as well as those treated with sulphuretted hydrogen (Forchheimer). Sulphuretted hydrogen is toxic to dogs. Is harmless only when injected in small quantities (Byron). Bergeon finds that the sputum in tubercular cases still contains bacilli when it is reduced to a mere mucus, which shows the gas is not inimical to this form of organism (Bruen). The perusal of the discussion at the meeting of the Association of American Physicians on the Bergeon method of treating phthisis by enemata of sulphuretted hydrogen and carbonic acid, described by Dr. Henry Bennet in THE JOURNAL last December, does not leave a very favorable impression on the mind. Between 50 and 60 cases altogether were mentioned, but in no one do we gather that the improvement was very marked; in a very considerable proportion the treatment had to be abandoned owing to the occurrence of colic, diarrhœa, vomiting and collapse (*British Medical Journal*, October 17, 1887). And so quotations might be multiplied indefinitely going to show we have not yet obtained the *desideratum* in pulmonary therapeutics, and the way is still open for further investigation.

The choice of the microbicide or antiseptic is of some importance. There are at present a sufficient number for all ordinary purposes, each having its favorites and its proper claim of usefulness. The favorites are bichloride of mercury, iodine, bromine, iodoform, turpentine and carbolic acid.

Dr. Renzi, of Naples, has employed inhalations of four kinds: 1. Iodoform and essence of turpentine —20 drops of a liquid containing 1 part of iodoform and 20 parts of spirits of turpentine; 14 patients were submitted to the treatment. 2. Iodine volatilized every day in a bedroom 30 cubic metres in capacity, in the amount of 0.40 to 2.10 grams, heated in a capsule by means of a sand bath; 3 operations were made. 3. Sulphuretted hydrogen evolved by the action of sulphuric acid on powdered sulphide of iron, in such proportion that every cubic metre of atmosphere in the chamber should contain 75 cubic centimetres; 7 cases were treated. 4. Sulphurous acid made by burning sulphur in a closed chamber, so that there should be 43 cubic centimetres of the gas in a cubic metre of the chamber. Of all the inhalations Dr. Renzi decides in favor of turpentine and sulphuretted hydrogen (*Lancet*, July 25, 1885; *Med. News*).

Prof. Arnaldo Cantani, of Naples, in view of the fact that other bacteria are destructive of Koch's bacillus, has recently made some experiments relative to the therapeutic treatment of tuberculosis by means of the bacterium termo. He first found by experiment that the bacterium termo, whether inoculated, inhaled or injected, exercises no baneful influence upon the tissues of living animals. He then caused a spray of fluid containing the bacterium to be inhaled by a patient suffering from tubercular disease of one lung, whose sputa contained tubercle bacilli in large quantities as shown by the microscope, and also by the results of injections practiced upon small animals. These inhalations, continued daily for a month, were followed by the rapid improvement of the patient, especially in the conditions. The sputa, examined at frequent intervals, were found to become less and less rich in the bacillus tuberculosis, but were full of bacterium termo, and their injection into the lower animals failed to produce tuberculosis (*Med. News*, August 29, 1885). On the contrary, however,

Dr. Ballazi has carefully followed the bacterio-therapy details advised by Cantani in 8 cases of advanced phthisis with moderate fever. During the inhalations the sputa were daily examined for bacilli and bacterium termo, with the following results: 1. In none of the 8 patients was a diminution of the bacilli demonstrated. 2. Fever, cough, and other symptoms were as troublesome during the four or five weeks during which the inhalations were given as before. 3. No arrest or regression of the phthisical process was at any time demonstrable by physical examination. 4. In one case diarrhœa occurred, which ceased only upon stopping the inhalations. 5. After ten to fourteen days the patients objected to the inhalations, and only 4 held out beyond four or five weeks. The nauseating smell and taste of the (freshly prepared) solution of bacterium termo decreased the appetite, and the strength of the patient also decreased (*Med. News*, July 10, 1886).

At a recent meeting of the Odessa Medical Society Dr. Filipovitch, of the Odessa Fever Hospital, made a very instructive communication on six cases of advanced pulmonary phthisis which had been treated by him after the bacterio-therapy method recommended by Prof. Amaldo Coutani. He obtained pure cultures and aromatized the mixture with one or two drops of peppermint and the patient made to inhale by means of Richardson's spray-producer. The inhalations were repeated twice daily. In one of the patients the experiment was given up at the end of a week since the man's state commenced to grow worse from the very beginning, and fever, steadily increasing bronchitis, and hemoptysis, had developed. Three other patients died under treatment; one in fifteen days and another after seven days, and the third after twenty-five days. The remaining two patients left the hospital after treatment for seventeen and fifteen days, respectively. Dr. Filipovitch came to the general conclusion that "no good whatever may be expected from the treatment of tuberculosis by the inhalation of the bacterium termo" (*British Medical Journal*, Oct. 2, 1886). The conclusions at which we may arrive in analyzing these remarks are: 1. That we have not yet discovered the ways or means to destroy microörganisms in the lungs in phthisical diseases. 2. That our studies probably have not been in accordance with the teachings of physical or vital laws in order to fulfil this indication. 3. That our failures in inhalation therapeutics may be due to misapprehension of the relationship of microörganisms to disease. 4. That it would be strange that if in the end we should discover that microörganisms are not carriers of disease, but only the result of putrefaction, whether we find them in the dead carcass on the plains or in the lungs of the refined in luxurious habitations. 5. That the object of our treatment should be rather to preserve structures in health than seek to destroy organisms which are not amenable to treatment.

MEDICAL PRACTICE ACT IN MARYLAND.—The Maryland Legislature has just passed a Practice Act similar to that of Illinois.

THE EARLY RECOGNITION OF EXOPHTHALMIC GOITRE (GRAVES' DISEASE).

Read before the Philadelphia County Medical Society, March 14, 1888.

BY J. MADISON TAYLOR, M.D.,
OF PHILADELPHIA.

In the paper which I have the honor to read to you to-night, I shall not attempt to do more than call your attention to the importance of early recognizing a disorder which often eludes one, to point out certain features which should enable us to do so, and to offer an illustration, very briefly, the salient points in half a score of cases.

Exophthalmic goitre, or Graves' disease, is not a rare malady. At first it is merely a disorder, but frequently becomes a serious disease, and is known to cause death. More often it unfits its victim for active usefulness, or, at least, limits this and sadly disfigures him.

Like certain other ailments the outcome of irreglar nervous discharge, what in its incipiency is a very manageable complaint, produces in time a disastrous effect upon the tissues, and forms a practically unconquerable disease.

Dr. Jonathan Hutchinson says:

"Graves' disease appears to me to be of the utmost importance, not only on its own account, but as what we might call a type malady. It is the most definite and striking example of which we know, of a severe and protracted malady which, despite its severity and persistence, yet has a natural tendency to recovery."

In reviewing a large number of cases in the search for a complete symptomatic picture, I find that the most constant early feature is sudden and marked evidence of loss of nervous equilibrium. The vasomotor nerves seem quite unstrung. Hence arise flushing, sweating, and other skin changes, diarrhœa and transient albuminuria. If at this time a careful watch be kept, I think we should find irregularities in the action of the pupil.

The skin usually loses its healthy hue, grows sallow or dark, and becomes greasy to sight and touch. This oily look was present in most of the cases I have seen, though I have not seen it mentioned elsewhere. Begbie recounts one case of pigmentation, or bronzing of the skin; Reynaud calls attention to vitiligo; and Edward Squire, to a discoloration in an isolated instance. The oleaginous appearance seems to me quite constant on face and body. This grows less when salt sponging and belladonna form part of the treatment.

Gowers calls attention to muscular tremor. I have seen this rarely. In cases 3 and 5 there is a tremulousness in the voice, which I ascribe to nervousness; yet it is constant.

The emotions become often so overwrought that various mental peculiarities excite apprehension. Or a wiser person may regard the case as one of pronounced hysteria; and, indeed, all through the malady hysteria remains present, more or less, leaving one not seldom in grave doubt.

Frequently delusions occur, and these so closely

in unison with the ordinary habits and thoughts of the individual as to render them most difficult of detection (see Case 6).

Dr. Hilton Fagge warns us to be on the lookout for "slight cases in which one or two of the cardinal symptoms may be absent throughout." Trousseau also insisted on this point.

Von Graefe expresses the opinion that among women it is not rare to find instances of this malady where the only symptoms are disordered action of the heart, not accompanied by valvular trouble or hypertrophy, nor the faulty action of the lid as described by him.

Heart disturbance most often leads the sufferer first to seek medical advice. The pulse is always quick and irritable, usually intermittent. The heart-beats, as a rule, bear surprising relationships to the pulse. Overaction of the heart is well known to be a frequent feature of anæmia and chlorosis. Begbie thinks it a powerful factor in causing Graves' disease. Ross regards the anæmia which is usually present as rather a result.

Throughout the whole vascular system there is a manifest lack of *tone*. So constant is this that it may yet be found competent to explain the causation of the disorder. Certainly the graver features bear causal relation to this state. The vaso-motor nerves seem all out of balance; nor can it be confined to one part, though the cervical sympathetic is most prominently involved. There are cases where limited areas not governed by the upper ganglia show derangement, as in a woman now under the care of my friend, Dr. E. T. Bruen, where one side sweats from shoulder to toe, and the opposite eye is prominent. Arterial tension varies rapidly, and unaccountably; hence, the oft complained of noises in the head, amounting at times to terrific roarings (as in Case 5). This may explain the maniacal attacks, as well as blood-spitting, thirst, and transient albuminuria.

The heart itself is rarely diseased. The overaction in time brings on hypertrophy; more commonly, dilatation. It also suffers from the general malnutrition which is noticeable throughout the circulatory system. The small amount of structural damage which this viscus sustains is a matter for remark, however, when the profound functional disturbance is considered. Systolic bruits are commonly heard, even over the auricles and the great vessels of the neck. Dyspnœa is distressing. This at times, even early in the history, alarms one who feels naught else to complain of.

The thyroid enlargement is liable to appear long before the eyes become prominent, but readily escapes attention. It may happen that a sense of constriction is felt when swallowing, especially in men who wear tightly fitting collars. Both lobes are, as a rule, enlarged; but if one only, it is generally the right. When recovery takes place, this badge remains to chronicle the victory.

The eye prominence is late to appear, as a rule, and it would seem to mark the height of the disorder. Before the exophthalmos, there may generally be noted the sign asserted by von Graefe to be pathognomonic, a belated action of the lid in following a downward movement of the ball. Sometimes the lower lid is tardy in following an up glance. This obtrusion of the eye-ball is the most picturesque feature, but happily it is not constant, and is often very late. It is of both eyes, mostly, but if of one only, again the right suffers. Sight is seldom affected, except where the outstanding, unprotected cornea suffers hurt or irritation; then opacities may result. If errors of accommodation exist, this correction, in my opinion, greatly aids in reducing the exophthalmos. Fundus lesions are not characteristic; though pulsation of retinal vessels may serve to confirm suspicions.

Knee-jerks are rarely abnormal; often in slight excess.

Electrical examination has been, very recently, shown by Charcot, and confirmed by Vigoroux and Norris Wolfenden, to aid greatly in fortelling the onset of this trouble, the bodily resistance being greatly lessened most peculiarly in this disease. This may prove a valuable aid in diagnosis.

Case 1 illustrates extremely well the more distinctive features other than exophthalmos, which is not present—especially the marked vaso-motor disturbance.

Jennie H., aged 23 years, single; no neurotic history, intelligent, hopeful temperament; somewhat emotional and talkative. Vague history of a fall at 2½ years, followed by a convulsion, and, from time to time, "fits" are described, but not clearly. At first they seem to have been epileptiform, but later resemble emotional overflow. At 14 years had typhoid fever, and for twelve months was "weakly." Some swelling of the limbs noticed—then came a period of good health. At 17 years menstruated first, but not regularly for a year or more. At 19 years began to work in a shoe factory, in a very exposed room, excessively cold in winter; frequently sat in wet shoes all day long. At 20 years, after a very painful day from cold, walked home in slush, profoundly exhausted: soaked her feet in hot water and went to bed. Then followed a nervous chill with throbbing pain at heart—it beat rapidly; an overwhelming sense of suffocation arose. From that moment the heart has been disordered. Then followed a series of medical pilgrimages to different dispensaries, with small benefit.

I think many of her symptoms were, even then hysterical, masking effectually her real trouble. She had hæmoptysis, cough, great emaciation, and was treated for phthisis. The fits brought her under treatment for epilepsy. So far as I can learn, no one noticed anything amiss with the eyes or neck. I think there has been at no time exophthalmos, but a peculiar fluctuation in the condition of the pupils, which I infer is not recent. The dyspnœa grew worse steadily, till it became impossible to lie in bed; and for six or eight months she slept fitfuly propped up in a chair. In May last a profuse blood-spitting prostrated her for four weeks; soon after the urine was suppressed for three days, with no pain—then a very dark, thick, offensive fluid passed. During the past summer was very weak and thin, but attempted

repeatedly to work. Over-exertion at the wash-tube bowled her over again; several hæmorrhages followed, and on October 1, she applied to me at the Howard Hospital.

I found a very pale, thin woman, suffering great dyspnœa; respiration 24; pulse fairly regular, 130 to 135; coughing incessantly; carotids throbbing wildly; pupils widely dilated; von Graefe's sign absent. There was complete mydriasis, as we found later, but no fundus lesion. The heart was laboring, loud musical murmur over base; apex beat downward and outward; "bruit de diable" in vessels of neck; thyroid gland enlarged, especially to right side, conveying thrill to hand; neck fourteen and three-quarters inches; skin pale and oily looking, readily sweated, and became chilly; legs œdematous; menstruation had been absent for three years; bowels always loose; urine, small amount, bright red with blood; sp. gr. 1.009; no casts; knee-jerks excessive in both legs; station bad from weakness.

Treatment.—The treatment consisted of carefully regulated feeding and rest; to drink plentifully of flaxseed tea; iron, in form of Basham's mixture, and digitalis, and hot hip-baths; belladonna plasters to the over-excited heart; later, cod oil and bromides, with digitalis. In a week the pupils became responsive to light; cough greatly moderated; the urine only smoky; heart sounds more defined.

To be brief, in two months the cough ceased; she could lie comfortably in bed; ate well and slept well; pupils became normal; had two or three "spells"—a little scolding aided these. In six months the girl pronounced herself cured, but she is readily upset by trivialities; twice the pupils have widely dilated on catching a slight cold, and once recently the urine showed traces of albumen. The menstruation was established twice, and slight showing at other times. She can now work at house chores with small fatigue. Pulse about 85 to 95, standing.

Case 2.—Mrs. H., aged about 28, no neurotic history, two living children, came under my care in 1881 during a miscarriage with adherent placenta. A similar disaster had occurred also some months before. My attention was drawn to a most disfiguring degree of exophthalmos. This had been observed within a few months by a well-known physician, who also warned her that she could scarcely hope again to bear a living child—probably on account of the disorder thus indicated. There was then menstrual derangement and great dyspnœa. Digitalis and ergot were ordered, also care to avoid exertion, but no clearly defined schedule of living. This I supplied and rigidly enforced—insisting upon systematic feeding and rest. I also found an irritable pulse and temper, muffled heart sounds, etc., but very slight right thyroid enlargement, a markedly livid oily skin, sweating surface, loose bowels, and occasional albuminuria.

Under treatment consisting, as stated, of regulated living, digitalis, ergot, along with iron and other tonics, she steadily improved, till in seven or eight months there remained only dusky skin and the eye and lid symptoms. These last I felt sure would improve under use of glasses rightly adjusted—she having a high degree of myopia. After some persuasion this was accomplished with most admirable results, for the exophthalmos materially lessened thereafter.

I may say, as a matter of interest, that I have since delivered this lady of three healthy children at term, each of which she suckled for a full year, and that she now enjoys excellent health. There is no heart trouble, no goitre.

Case 4.—Graves' disease; obscure and abrupt cause; extreme nervousness, cardiac distress; death. No autopsy permitted.—Mrs. S., aged 36, no neurotic history; one child. Two years ago she seemed in perfect health, weighed 160 pounds. Happily married, surrounded by every luxury and loving care. Sustained no shock, no fright or exhausting disease. Fell into the hands of gynecic surgeons, who found displacements and tears, and repaired these, as it proved none too well. While sitting in perfect health at a theatre, not in the least excited or especially interested in the play, she suffered a nervous chill, and from that time the disorder rapidly grew. The chills frequently recurred, changing to what she described as "waves of feeling up and down the body;" on the slightest exertion sense of constriction in chest, and skin broke into a sweat. Afraid to step about the room. Bowels loose, slept badly, lying awake for hours feeling afraid. The disorder was not recognized.

Sent to Dr. Weir Mitchell with a description of "neurasthenia and heart disease," and through his courtesy I was allowed to see her repeatedly. She was a very exciteable nervous woman, rather thin, weighing 110 pounds, with a frightened, restless expression. Eyes slightly prominent, some little slowness of upper lid, injection of cornea, tremor in voice, tremulousness of hands on movement, constantly plucking at bed clothes or handkerchief, or arranging her hair or dress; throbbing carotids, pulse of 125 to 135 lying, and very irregular, loud musical murmur, etc. Bronzed, glistening skin, chilly hands and feet, sweats readily, etc. Thyroid enlarged almost symmetrically conveying thrill to the hand. Some improvement under rest and tonics. Another operation was found necessary, and though slight, she sank and died. No autopsy allowed.

Case 4.—Graves' disease; slight exophthalmos; slight thyroid enlargement; cardiac disturbance; delusions and rapid loss of flesh; cause probably exhaustion from bearing ten children, and precipitated by sharp dysentery; recovery.—(By permission of Dr. Weir Mitchell and partly under my care.) Mrs. J., aged 39 years, family history good, most favorable surroundings; ten children; began a year ago to lose flesh rapidly during severe dysentery; appetite very poor since. Slight delusions; vertigo. Eyes only noticeably prominent; corneal vessels injected; restless expression; slight tremor; skin clammy and glistening; dyspnœa. Thyroid enlarged a little; heart noisy; no valve defect; very emotional; albumin and muco-pus in urine. Under tonics and rest gained steadily. Referred to me at seashore in summer; rapidly picked up flesh and

strength there; gained forty pounds. Now describes herself to be in good health.

Case 5.—Graves' disease; slight ophthalmos; slight thyroid enlargement; cardiac disturbance and tremor; improvement.—Miss R., aged 25, history good. At 10 years had typhoid fever, at 11 very severe dysentery; long in regaining strength; much headache at 19 years, an illness began by neuralgia in face and marked prostration; noticed rapid breathing; soon eyes were remarked as being "curious looking;" tried to gain strength by exercise in open air. In 1881 again fell ill. In March, 1882, consulted Dr. Seguin, who pronounced unfavorably; at that time had much œdema in legs; ordered digitalis; quiet. Following November grew much better; partly in bed for several months. December, 1883, she saw another physician who relieved the increasing diarrhœa. May, 1881, to May, 1884, menstruated only once; thence irregular till a year ago, since then fairly regular. Weight about 135; skin moist and shiny; beads of sweat on upper lip; tremulous lip and tremor in voice, this seems a constant feature; at times tremor in muscles elsewhere. Exophthalmos slight; von Graefe's sign in both eyes; pupils normal; corneal vessels injected; flushes readily; not pale; heart tumultuous; no valve defect; pulse intermittent, one beat in three or seven, very difficult to count. Thyroid enlarged symmetrically; well-marked thrill; loud bruit in right neck; buzzing in head; sweats almost constantly; respiration 28, sighing; dyspnœa great on slight exertion; cannot lie in bed at night; bowels loose.

Rapidly improved in most respects under treatment by regulated living, digitalis, and belladonna, tonics, iron, etc.; salt sponging; hot hip baths; menstruation more comfortable. In January had an attack of nervousness at night time, sense of great pressure in head and flashes of heat over body; ringing in ears. Eyes were examined by Dr. de Schweinitz, who found slight hypermetropic astigmatism; no fundus lesion. Alternate hot and cold water to nape of neck relieved the sounds in head. Is steadily improving to date.

Case 6.—Miss D., aged 24, family history decidedly neurotic. Mother "queer." At one year scarlet fever followed by water on the brain;" soon recovered good health. Menstruated at 15.

August, 1885. Dysentery.

December, 1885. Heart began to alarm her. Vertigo sitting or walking; grew weak, short of breath, and extremely nervous; could not sleep, began to groan loudly in sleep, which continued till recently. Skin itches intolerably; sweats readily on exertion. Roaring noises in the head. Legs swelled, also feet—"the buttons were burst from the shoes."

March, 1886. Neck enlarged. In May the eyes started forward. Appearance: eyes very prominent, sclerotic shows half an inch or more above and below, lids puffed, corneal vessels injected, face bloated and livid, skin greasy. Thyroid enlarged in three directions, most on the right; neck thirteen and three-quarters inches. Heart sounds clear; impulse heaving; slight systolic whirr. Pulse regular, 112 standing. Bowels very loose; tremulous voice. Eyes examined by Dr. Hansell show some accommodative defects, but no fundus lesion. Urine albuminous. Decided delusions. No improvement.

Case 7.—Miss M. D., sister to above, well-grown girl, well till a year ago, when she had "walking typhoid;" afterward very weak; fainting spells; vertigo on walking; sweats readily; constantly chilly; especially the hands and feet. Buzzing in the ears. Menstruated at 13, but extremely irregular; rarely lasts over two days. Eyes showed no lid sign; no exophthalmos. Thyroid enlargement right; neck twelve and three-quarters inches. Heart quick and feeble; muffled sounds; roaring noise over the right clavicle and through the thyroid, also marked thrill. Carotids pulsating visibly. Pulse 128 to 130. Very pale. Is improving.

Case 8.—Mrs. S., aged 46; mother living, a "fidgety" woman, has two children. Fairly good health till 1881, when she had typhoid fever, followed by large abscess in the abdomen, opened in two places. Treated in the Jewish Hospital. After this shortness of breath began. In 1881 a financial blow greatly worried her; she would sit and brood over her troubles. then the fever. Exophthalmos began, along with diarrhœa; sweated a great deal on both sides. Buzzing in the ears. Appearance: strongly built woman, weight 130 pounds; skin muddy and dusky. Left eye very prominent, right less so; lid signs of both eyes. Carotids throb moderately. Heart sounds clear and distinct; slight bruit. Has been under treatment for eight or nine months. Digitalis and iron and belladonna. Dyspnœa greatest on cold days. Urine at times profuse; no albumen. Œdema of legs fluctuates. Is steadily recovering, though susceptible to fatigue, cold, and shocks.

I hope to discuss the treatment, on which I have some decided opinions, on another occasion. This consists mainly of rest, judicious feeding, tonics, and carefully selected sedative measures.

Competent glasses, too, are essential; at times sharp counter-irritation, especially diuretic remedies and attention to the emunctories. Galvanism, too, has immense value in some instances, but requires judgment in selection of cases.

In brief, whatever measures tend to repair the tone of the vascular system and allay nervous excitability will best bring about gratifying results.

ELECTRICITY IN MODERN MEDICINE.

Read before the Medical Society of the District of Columbia, December 7, 1887.

BY ROBERT REYBURN, M.D.,
OF WASHINGTON, D. C.,
PROFESSOR OF PHYSIOLOGY AND OF CLINICAL SURGERY IN HOWARD UNIVERSITY.

About one hundred years ago, a Professor in the University of Bologna, named Galvani, was experimenting with the nerves of the lower extremity of a recently killed frog. He found that by placing a piece of zinc under the upper portion of the nerves, and touch-

ing the upper portion of the nerves with a piece of copper wire violent contractions of the thigh muscles would immediately ensue. Very likely others before him had observed the same phenomenon, and had looked upon it with simple curiosity without caring to inquire why this was so. Prof. Galvani, however, was not of this class, and he pondered the matter, as in the presence of his students he over and over again repeated his experiments. His final conclusion was that a mysterious and occult form of animal electricity was produced, having the power to act upon the nerves, and thence to the muscles of the body; and this force has been called, from its discoverer, Galvanism.

Little did Galvani know how far-reaching and wonderful would be the results of the discovery he had made to the comfort, health, and even lives of his fellow-men. Another Professor, in a rival University, that of Pavia, Professor Volta, repeated the experiments of Professor Galvani and confirmed the facts but could not agree with the explanation given. He asserted that the contact of the different metals was the cause of the galvanic current which produced the contractions in the legs of the frog. Hot and furious raged the contest between the partisans of the two theories of galvanism for many years, but we now know with certainty that Professor Volta's theory was more nearly the correct one; to this is due the fact that this force is called, indifferently, galvanic or voltaic electricity. Professor Galvani, the first discoverer, found, like many another man, that his labors to a great extent were simply the scaffolding upon which others climbed to still higher heights of science. Faraday then still farther carried on the theory of galvanic electricity, and showed that the amount of the galvanic current present is directly dependent upon and proportionate to the amount of chemical action. But the time fails me even to mention the names of the many great men who have devoted their lives to the development of electrical science. To Ohm we owe the celebrated law of electricity that has brought it from empiricism to those of exact science, and the labors of Seebeck, Oersted, and Ampère have marvellously aided in its development.

But "*cui bono*," as the Spanish say, is all this history of the progress of galvanism. I now turn to what is a much more interesting topic to the layman as well to the medical man, namely, the application of galvanic or voltaic electricity to the cure of disease. Most persons know that a galvanic battery, so-called, is composed of plates of zinc, copper, or of other metals that are immersed in acids or chemical solutions. The terminal plates have attached to them wires or connecting metallic cords, which are called the negative and positive poles of the battery. When we touch or connect the poles of the battery together we find that a certain force, namely, the galvanic current, so-called, is developed capable of producing certain changes in the body. If the galvanic current is passed through a coil of wire under certain conditions of rapid alterations of the current we have a somewhat disagreeable feeling known by the name of the galvanic shock, which is accompanied by violent contractions of the muscles of the body. While the galvanic shock is a valuable addition to the armamentarium of the physician in treating cases of paralysis accompanied by atrophy or wasting away of the muscles, or in cases that require a stimulating application, yet, after all, the use of this kind of galvanism is comparatively limited and insignificant compared with the benefits derived from continuous, gentle, yet powerful applications of this wonderful remedial agent. It is found that by placing the two poles of the battery carrying the galvanic current in contact with the external or internal parts of the body, that the most powerful effects may be produced. Tumors and neoplasms of all kinds, for instance, may be dissolved without the use of the knife or caustic destructive agents, or in any way injuring the textures or vital organs of the body.

In order to show that this is possible, I will simply give you a sketch of what has been done by Prof. Apostoli and others for tumors and morbid conditions of the abdomen, more especially in females. In his paper read before the British Medical Association, in Dublin, Aug. 2, 1887, Prof. Apostoli said that during the five years from July, 1882, to July 1887, he had treated 403 patients, and made to these patients 5201 applications of electricity. Two hundred and seventy-eight of these patients suffered from fibroid tumors of the uterus, or uterine hyperplasia of various kinds. Space will not permit me to go into details but the final result is that 95 per cent of those persons were cured, and restored to a condition of usefulness to their families and to society, and out of the entire number only two died during the treatment. These results so far surpass any other method of treatment ever adopted as to attract the attention of physicians of all countries, and in our own country Drs. Marcy, Newman, Cutter, Martin and Garrett have likewise adopted it with great success.

It will be necessary to explain to those that have not studied the laws of electricity, that when the positive and negative poles or terminals of a galvanic battery are placed in a fluid it is decomposed and the components of the fluid arrange themselves in a certain order around each pole, oxygen, chlorine, iodine, etc., arranging themselves around the positive pole, and hydrogen, the metals, etc., arranging themselves around and in contact with the negative pole. Prof. Apostoli, by the use of very powerful currents of electricity, from 50 to 150 milliampères, and sometimes using even as high as 200 milliampères, actually produced a galvano-caustic and electrolytic effect, which effectually dissolves the tissues of the tumor and causes its disappearance without the use of the knife. He also uses the electro-caustic method.

The objection may be raised that if the powerful galvanic currents can dissolve the substance of tumors why do they not dissolve the healthy tissues? The answer to this probably is, that in the first place morbid growths such as tumors and hyperplasia of vital organs have not the same resisting power or vitality as the healthy parts of the body. A tumor, for instance, is much more easily injured by a blow or other hurt than the healthy organs. It will inflame or even ulcerate by an amount of violence that would

not apparently wound the body in the natural or healthy condition. Another reason for this exemption from injury in the application of these strong currents is the precautions taken in using large electrodes or poles when applying them to the body. As the strength of the current is to a certain extent in proportion to the square surface of the electrodes or poles if, for example, we apply a certain strength of current to an electrode one square inch in area, by increasing the area of the electrode to one hundred square inches we give the current one hundred times as strong with little more disturbance of the parts than when employing the weaker current. In order to prevent injury to the external parts of the body the external electrode is covered with wetted clay, cloth, flannel, wet sponges, etc. The negative pole is usually placed in contact with the tumor and the positive pole on the outer surface of the body adjacent to the tumor or inserted into the substance of the tumor. The positive pole, you will remember, is always the one by which the electric current leaves the battery, and the negative pole the one by which it reënters it. The positive pole has very powerful properties in arresting hæmorrhage from tumors, and hence is frequently applied in that class of cases with very beneficial results.

Dr. Alfred C. Garrett, of Boston, reported to the Ninth International Medical Congress, recently held in Washington, 184 tumors of the breast treated by galvanism, from 1864 to the present time, in his practice. One hundred and fifty-seven of these were cured and disappeared entirely. Several others did not become quite obliterated and a small lump remained that gave no inconvenience. In every case the tumor disappeared or became harmless. He also recommends the use of soft, large poles with currents of from 10 to 50 milliampères.

Dr. Ephraim Cutter reports 400 cases of fibroid tumors treated by electricity, with the greater portion relieved. Dr. F. H. Martin, of Chicago, read a very interesting paper upon the electrical treatment of fibroid tumors, before the Gynecological Section of the Ninth International Medical Congress, and enumerates the following advantages of this method of treatment, viz.:

1. It is entirely free from danger.
2. It is absolutely painless.
3. It invariably checks hæmorrhage.
4. It rapidly reduces the size of tumors.
5. It relieves neuralgic pains.
6. It admits of exact dosage, so that we know exactly how strong a current we are using.

Dr. R. Newman, of New York, reported to the Section on Surgery, American Medical Association, which met in Chicago, June, 1887, his record of 100 cases of stricture, making 200 in all, which have been cured by the galvanic current. The concurrent testimony given, and which might be largely augmented if necessary, shows clearly that we have in galvanic electricity a most potent remedial agent, which is to revolutionize some of the branches of the healing art.

I have mentioned several times the words *ampère* and *milliampère*, and it may be necessary in explanation to state that the ampère is the measure of the strength in intensity of the galvanic current. Let us imagine the galvanic current flowing along the wires connecting the poles like the flow of water in a river. As the water flows along the banks with greater or less friction, the rapidity of the current is retarded or accelerated; just so with the galvanic current. It is retarded in its progress more or less, and this resistance to the current we can measure. The unit of resistance, or rather rate of velocity, is called the *ohm*, from the celebrated scientist, and is composed of a column of mercury one square millimetre in section and 106 centimetres in length. The unit of the intensity of the current is the ampère, from the name of the distinguished French electro-physicist.

To give this concrete expression, it may be stated that an ampère represents the quantity of galvanic electricity generated by the unit of electro-motor force, the volt circulating in a conductor having the unit of resistance the ohm, during the unit of time. The volt is the measure of pressure or difference of potential of the current. It has been ascertained practically that this is the quantity of electricity furnished by a Daniels' battery. Having now obtained a standard, namely, the ampère, we can measure the intensity of our electric current just as accurately and almost as easily as we can measure a distance upon the earth by the use of the English yard or the French metre. The instrument by which this is done I now show you, and it is called the milliampèremetre. As its name implies, it is a measure of the intensity of the electric current, and enables us to know just as exactly the dose of galvanic electricity we are administering as we know the dose of medicine we are giving to a patient. It is capable of measuring from one-tenth of a milliampère to 500 milliampères, and is destined to do as much for the application of electricity to medicine as the use of the clinical thermometer has done in accurately determining the amount of fever present in a patient.

PAPILLOMATOUS CYSTIC TUMOR OF OVARY, WITH A HERNIAL POUCH DEVELOPED IN THE CICATRIX OF THE ABDOMINAL WOUND FROM A FORMER OVARIOTOMY.

Read before the St. Louis Medical Society, March 10, 1888,

BY L. H. LAIDLEY, M.D.,

PROFESSOR OF GYNECOLOGY BEAUMONT MEDICAL COLLEGE; SURGEON TO PROTESTANT HOSPITAL; CONSULTANT TO ST. LOUIS FEMALE HOSPITAL.

Mrs. C., æt. 39, American, married, had one child which is now eight years old, gave the following history: She was of healthy parents, menstruated at 14 years, was a healthy girl, married at 22. Eight years ago she had an ovarian tumor removed from the left side (it was a large, multilocular, benign ovarian tumor). One year after the operation she was delivered of a child at full term. The recent operation and the pregnancy developed a large hernial pouch, which allowed the bowels to protrude, forming a tumor as large as a child's head at full

period. No instrument could be made to keep the hernia in position, and for the past two years she was confined to the house. Eleven months prior to my first visit another tumor made its appearance, beginning in the right iliac region; it developed rapidly, occupying a position on the right side which could readily be felt through the hernial sac. Five months after its first appearance a "magnetic doctor" was allowed to treat the case, which he did by "the laying on of hands," in this case rather roughly, as the results will show. This doctor claimed "to coax the fluid out through the Fallopian tubes." When the tumor was pressed upon the patient noticed a great rush of water with blood from the vagina. This was repeated some time afterwards with the same results, the tumor almost disappearing.

I was called last November, and found a deplorable state of general health; anæmic, appetite poor, and patient so weak that she could not go from her chair to the bed without considerable fatigue. She had a distinct mitral bruit, weak and rapid pulse, temperature 100° F. I continued to visit her for one month, feeding and administering medicines to build her up. She urged an early operation. An examination of the abdomen revealed a tumor in the right iliac region as large as the head of a child at full period, which was fluctuating, movable, and easily defined by percussion. The uterus was plainly felt through the hernial pouch, separate from the tumor. Change of position did not influence its shape. No œdema of lower extremities, nor abdominal dropsy. Examination *per vaginam* showed a violent vaginitis with an opening through the floor of Douglas' culde-sac, which allowed the passage of a sound in the direction of the base of the tumor. A fluid escaped through the opening; pressure on the tumor increased the flow. That which escaped was white in color and mixed with blood. The amount of flow a day was estimated by the patient to be one pint. Diagnosis: Cystic tumor of right ovary, probably uniocular, with fistulous opening into vagina.

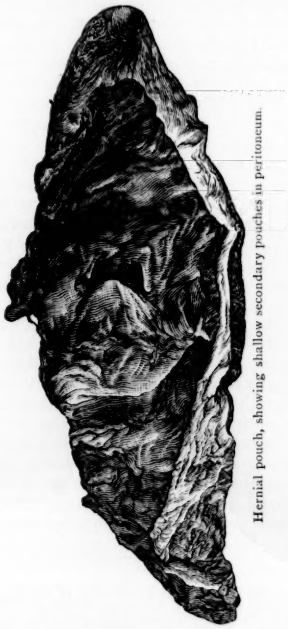
An operation was performed December 6, with every antiseptic precaution, assisted by Profs. Coles and Graves, and members of the senior class of the Beaumont Hospital Medical College. An elliptic incision was made over the site of the tumor, at least seven inches in length, the tumor exposed and the fluid drawn off, which was the same that flowed from the opening into the vagina. There was only one adhesion to the tumor; that of the extremity of the appendix vermiformis. This was torn off with the finger nail, and the end cauterized, completely controlling hæmorrhage. (Greig Smith reports his having to remove the entire organ without serious results.) The tumor was lifted from its broad base, which was transfixed at its attachments to the floor of the pelvis, the ligature tied, and all that remained of the sac charred with a hot iron. Another ligature was placed below, and entirely around the pedicle, so as to close any opening that might exist with the fistula leading to the vagina.

Attention was now given to the hernial sac. Before operating the line of incision was mapped out with iodine so as to remove all the pouch, and at the same time be able to approximate the walls. The measurements before operation were seven inches by four and a half inches; a portion of the mesentery was attached to the cicatrix of the old wound, and it was ligated, cut and returned to the abdomen. The cavity was thoroughly cleansed of blood, the edges of the wound (closed with sutures less than one-half inch apart) were made to coaptate accurately, a drainage-tube was placed in the lower angle of the wound, the parts dressed antiseptically, and the patient put to bed. Reaction was complete within two hours, and for the first time since November her temperature was less than 100° F. A most aggravating nausea, which would not yield to any of the prescribed remedies, necessitated feeding per rectum from the first day. The temperature range for the first twenty-four hours was 99° to 99.8°, pulse 72 to 80. She did not sleep more than one-half hour during the night. On the second day the temperature continued less than 100° until 9 P.M., when it rapidly rose to 103.8°; the pulse was rapid and weak, a dusky hue of the face was present with constant nausea, which forbad anything remaining in the stomach.

Papillomatous cystic tumor of ovary.

Believing that I had an incipient peritonitis to deal with, I ordered calomel, grs. ijss, placed upon the tongue, which was the first retained since the operation. I continued the dose every half hour until ten grains was used, when I gave every hour mag. sulph. grs. xx—two doses were given. At 2 A.M. the next morning, by the use of a rectal tube, a half pint of thin fecal matter was expelled, which was followed by an enema, and the bowels thor-

oughly cleaned out; flatus for the first time began to pass; the patient became free from pain and slept for six hours. The temperature went down to 99.6°. From this time she retained food, and showed nothing unusual in the progress of the case. On the seventh day the stitches were all removed (the tube having been removed on the fifth day) showing the walls had united by first intention. A well-fitting truss, made from the cast of the abdomen, was adjusted four weeks later, which allowed the patient to go about the room with comfort. Examined three months later, she was much improved in health, the fistulous opening into the vagina had closed, and the operation had proven entirely satisfactory. I submitted the tumor for examination to Dr. Adolf Alt, who said it was of the papillomatous form.



Hernial pouch, showing shallow secondary pouches in peritoneum.

Coblenz believes that when ovarian tumors show a papillomatous development they invariably arise at the hilum of the ovary; this form is the most common affecting these organs, and like villous growths elsewhere is not always malignant. In the malignant form papillary growths will be found in patches upon adjacent structures, or else the womb and broad ligaments are also involved in one cauliflower-like tumor. Tait observes that he has had two cases of ovariotomy in which he left large masses of papilloma attached to the womb, yet in each case these masses wholly disappeared and the patients are both in perfect health. If this is true, may we not hope that this specimen is a benign tumor?

This tumor was roughly handled five months before the operation, causing the fistulous opening. May we not conclude, if it is true, as Tait and Bantock claim, that tapping hastens degeneration, and after an accidental rupture of such a cyst the peritoneum will be found studded with patches of papillary cancer (hence they argue that ovarian tumors should never be tapped and that they should be removed in their earliest stages before any malignant transformations have taken place), that had this tumor been removed entire at the time it was injured, there would be no question that it would not return?

Grand and Washington Aves.

SIMULTANEOUS TRIPLE AMPUTATION FOR RAILWAY INJURY, WITH REMARKS ON THE TECHNIQUE OF MULTIPLE AMPUTATION.

Remarks before the College of Physicians of Philadelphia, March 7, 1888.

BY JOHN ASHHURST, JR., M.D.,

PROFESSOR OF SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE UNIVERSITY HOSPITAL.

This patient is brought before the College largely on account of the rareness of simultaneous triple major amputations. It is quite possible that some of the Fellows may not have had an opportunity of seeing such a case.

The patient is a Moor, 20 years of age. He was admitted to the University Hospital November 28, 1887, having been run over on the Pennsylvania Railroad. I saw him within two hours after his admission. I found a compound comminuted fracture of the right leg, the laceration extending above the knee; complete avulsion of the left leg, the limb having been torn off in its lower third; and a compound fracture of a severe character of the right hand and wrist. There was also a compound fracture of the skull, involving the frontal bone. This, however, was an impacted fracture, of course without much depression, and did not require interference. In addition to these injuries there were numerous brush-burns and contusions, some of a grave character. One upon the left buttock was so severe that the separation of the slough left a cavity fully two inches in depth. Notwithstanding these serious injuries, the patient's general condition was very good; he had reacted thoroughly, and his axillary temperature was 99° F. Under these circumstances I felt justified in proceeding to the immediate removal of the injured limbs, and amputated successively the right thigh by the antero-posterior flap method; the left leg, about its middle, by a modified Sédillot's external flap operation, the modification consisting in making both flaps from without inward, instead of cutting the external flap by transfixion; and the right forearm by an oval incision, making use of the uninjured skin of the back of the hand and wrist. Certain variations from the ordinary procedure in amputations I shall refer to when I come to speak of what I have ventured to term the technique of multiple amputations. After the operations were completed, the temperature had fallen only to 98° F. The patient had no bad symptom and rapidly recovered, and as you

see him now all his wounds are perfectly healed, and he is entirely well.

I have collected some statistics of synchronous multiple amputations. I am able to find but one instance of *quadruple* synchronous amputation—a case in which the operations were done for frost-bite by Dr. George E. Jackson, of Dakota. There are several cases recorded of multiple amputations, not synchronous, the one which approaches nearest to a synchronous operation being that of Champenois, a French surgeon, who amputated three limbs on one day and the fourth a few days later.

Of synchronous triple amputation there have been reported four successful cases, not including that presented to-night: one by Dr. Köhler, of Schuylkill Haven, Pa.; one by Dr. Lowman, of Johnstown, Pa.; and two referred to by Professor Agnew, in his *Surgery*, one occurring in the practice of Dr. Stone, of New Orleans, and the other in York, the name of the surgeon not being given. There are reported four or five triple amputations not synchronous. I have myself resorted to synchronous triple amputation in two cases. Several years ago I had occasion to perform this operation, removing both legs and the right forearm of a man æt. 45 years, of intemperate habits. The patient died on the tenth day, the fatal result being due rather to the visceral lesions resulting from alcoholism than to the operation.

Double amputations are comparatively numerous. I have personally performed fifteen such operations, this number not including two successful cases of double partial amputation of the feet. I have done fifteen double major amputations, of which five have ended in recovery. One of the patients who recovered I had the honor of exhibiting to the College some years ago; the amputations in his case were through the right hip-joint and through the left leg. In the fatal cases, seven of the deaths occurred in less than one day, the immediate result of the shock of the injury and of the operation. Three patients died, one in three days, one in four days, and the third in eighteen days. The latter would probably have recovered but that he also had suppurative disease of the middle ear, which appeared to be the cause of the pyæmia which proved fatal; for when the stumps were examined, after death, they were found to be in good condition.

With regard to what I have termed the technique of multiple amputations, there are some points which my experience justifies me in urging upon surgeons as of importance in promoting success: In the first place, it is very important that the time occupied by the operations should be brief; that the operations should be done systematically, so as to keep the patient under the anæsthetic as short a time as possible. The next point, perhaps of even more importance, is to keep up the temperature of the patient during the operations. I have been led to think that this is, perhaps, of more importance than anything else. Of course, loss of blood must be scrupulously guarded against, and loss of blood directly causes loss of temperature. In this case, hot cans were kept around the patient during the entire operation, and in order to save time I operated systematically, the tourniquet and Esmarch bandage being both employed to prevent any loss of blood. I began with the most serious injury, and this is, I think, a point of importance. It may happen that, after the removal of one limb, it will be found that further operation must be postponed on account of the patient's condition, and then it is, of course, better to leave him with the less severe injuries. In this case I began with the thigh. After amputating the limb, I secured the main vessels, which were readily found. I attempted to tie the arteries with catgut, but as the ligatures broke, I substituted silk and, in order to save time, left both ends uncut. I next amputated the right leg, securing the vessels in the same manner, and then passed to the forearm. I then came back to the right thigh, screwed up the tourniquet and removed the Esmarch bandage, and secured all the vessels that required ligature, then passing to the other limbs in the same order as before. After the vessels had been secured in each case, a towel dipped in a hot antiseptic solution was placed between the flaps. The wounds were then dressed in the same order, and in this way the operation was completed in a comparatively short time.

The points which I have mentioned I believe to be of great importance, and I think that much of the disappointment of surgeons from these operations is due to a want of attention to these matters.

I should also say that, in order to preserve the bodily heat, I did not use irrigation during the amputations. I think that this often seriously reduces the temperature, and even in comparatively slight operations where it has been used, I have seen the temperature fall to 97° F., and even 95° F. I think that in any grave case, it is better to omit it and to rely upon washing with hot antiseptic solutions before and after the operation. Also, the packing of wet towels around the seat of operation, as is very commonly done, tends to depress the temperature, and in grave cases should be omitted.

I think that it is to an observance of these precautions that I have owed success in this case, and in many other serious operations of various character.

MEDICAL PROGRESS.

PHYSICS OF THE MALE URETHRA.—MR. W. W. WAGSTAFFE says: I have been struck, during the passage of catheters and bougies in the out-patient room, with the fact that a natural twist is given to the instrument during its removal from the bladder and urethra of the male, a rotation very sensible to the feel, especially when light and flexible instruments are used. In order, therefore, to test the accuracy of one's impression I have adopted, after various trials, the simple one of using a bougie à boule of medium size (about No. 10 of English measurement). This is passed thoroughly into the bladder, and then withdrawn until a check is felt by the neck of the bladder. From this point the observation starts, and the distances are taken from this start point.

The degrees of rotation are estimated by means of a pin fixed vertically into the stem of the bougie just outside the meatus. The bougie à boule having so fine a stem, and a bulbous end which can be readily grasped by the part of the urethra it is in contact with, is rotated with readiness, and I have therefore been careful to avoid any rotation being given to it by external means. I have found that the simplest means of withdrawing the bougie has been by a piece of fine silk noosed round the stem near the top. After its first start, however, so little traction is necessary that the observations have to be taken promptly, as the instrument is passing often without any external traction. The shape of the bulb of the bougie à boule no doubt helps to explain this forward movement, as the urethra contracts upon a conical mass. Where stricture is said to have existed in these cases it was either very slight or imaginary, for the bougie equal to No. 10 English passed without difficulty. When a rather larger instrument was used no material difference was noticeable in the results, but, as may be seen in Obs. ix and x, a larger instrument sometimes showed the results more clearly; and in this case the urethra was larger than usual.

The first result of these observations is that in all the cases the direction of the rotation given to the bougie is the same. In one case the rotation began with a small divergence to the patient's right side, but this was followed by the usual rotation to the patient's left. In all the other cases rotation began at once to the patient's left for a certain distance and to a certain degree—generally making the index stand directly opposite its original position—passing, that is to say, through 180° or half a circle. This position was reached when the instrument had passed about 4 inches from its start, and then began a reverse rotation, usually, but not invariably, until the index stood at right angles to the start. An explanation of the phenomenon is probably to be found in the peculiar construction of the urethra. In the ordinary (collapsed) state the canal is represented by a fissure bounded by columns of mucous membrane which may be traced from the bladder outwards, running in the direction of an elongated spiral and causing progressive alteration in the form of the channel. The change begins in the prostatic urethra, where the tube as seen in transverse section takes the form of an inverted U, owing to the upward projection of the verumontanum. It is at this point that the rotation of the catheter begins. At the apex of the prostate the fissure is shorter and horizontal, with only a slight convexity forward. In the membranous urethra the section becomes stellate, in the bulbous horizontal, with a slight sinuosity. The latter form is maintained through the greater part of the penile portion of the canal, but in approaching the glans is gradually replaced by an inverted T, the vertical limb of which, at first very short, gradually elongates, while at the same time the horizontal limb becomes shorter and at length disappears, leaving a single perpendicular slit that ends at the external meatus.

In tracing out these changes carefully upon the subject it will be found that the urethra is rifled somewhat after the manner of a gun-barrel, but the spiral of the urethral tube, which runs from right to left in about the upper three-fourths of its length, usually becomes reversed near its distal extremity. The object of the spiral grooving in the case of the gun is to secure for the projectile a rotatory motion and greater precision in the direction of aim, and we may fairly assume that similar advantages of a physiological nature are gained for the outflow of the urine[1] and semen by the arrangement of the urethral column.

The practical application of these observations is not yet obvious, but it is a question whether the arrangement of the urethral mucous membrane may not point to the kind of rotation which would render most easy the introduction of a catheter.—*St. Thomas' Hospital Reports*, vol. xvi.

Operations for Rectal Fistula.—Greffrath reports 61 cases of rectal fistula operated on in the Heidelberg Polyclinic. The fistulæ occurred between the ages of 20 and 40 years in 57.4 per cent. of all cases. The youngest patient was 6 months old. Only 1 case occurred in a woman. The fistula was incomplete external in 65.5 per cent.; incomplete internal in 4.9 per cent.; and complete in 29.5 per cent. Of the incomplete external (33 cases noted) the fistula was lateral, between the anus and tuber ischii in right side, in 24.2 per cent.; on left side, same situation, 39.4 per cent.; around the anus, with different openings, 24.2 per cent.; external opening in the middle line behind the anus in 12.2 per cent. The seat of the incomplete internal fistula was in every case just above the external sphincter. Of the complete fistulæ (noted in 17 cases) the seat was on the left between the anus and tuber ischii in 41.2 per cent.; right, same situation, 17.6 per cent.; around the anus, with different openings, 5.9 per cent.; external fistulous opening posterior 23.5 per cent.; anterior 11.7 per cent.

Of the 61 cases 10 had symptoms of pulmonary tuberculosis, 7 had hereditary tendency to tuberculosis, 2 had diabetes. Of the patients 2 had had acute rheumatism, 1 attributed his trouble to long-standing hæmorrhoids, 1 to eczema, 3 to local injury. In 9 the fistulæ seemed to have come on spontaneously, and 43 gave the history of a small abscess having formed and caused the trouble.

In 16 cases the fistula was operated on by means of the knife, in 43 with the thermo-cautery. Of the 16 operated on with the knife 11 had normal internal organs, 3 had symptoms of pulmonary tuberculosis, and 2 had hereditary tendency. Of the 11 with healthy organs 80 per cent. were completely cured, 1 died (of tabes?), and 1 was not completely cured. Of the 3 phthisics 1 died of sepsis, 1 was not cured, 1 lost sight of. Of the 2 with hereditary tendency 1 was not cured, 1 lost sight of.

Of the 30 cases with healthy organs treated with the thermo-cautery 4 were lost sight of, 22 were

[1] It is sometimes stated that a twisted stream is one of the early signs of stricture, but this is misleading, since the normal outflow is always perceptibly spiral. This phenomenon is perhaps not altogether due to the urethral rifling, since it has been found that water forced out of a narrow, smooth-edged slit does not continue in a straight "tape" jet, but is shot out as a spiral.

completely cured (85 per cent.), 3 not completely cured, 1 died (presumably of phthisis). Of the 5 with hereditary tendency 2 were completely cured, 2 died of phthisis (whether fistula was cured or not is not known), and 1 died, with questionable diagnosis. Of the 7 with phthisis treated with the thermo-cautery 2 were lost sight of, 1 completely cured, 2 not cured, 2 died of phthisis, uncured.

Greffrath concludes thus:

1. The eschar made by the thermo cautery protects the wounded surface better from infecting material from the first day, and with care the patient may go to stool on the first or second day after the operation.

2. The operation can be done in a few moments without hæmorrhage of any importance.

3. Better granulations are obtainable from the thermo-cautery than after the use of the knife.

4. The eschar of the cautery makes the immediate adhesion of the wounded surfaces impossible.

After the use of the thermo-cautery antisepsis can be carried out more efficiently, and Greffrath recommends iodoform as an excellent antiseptic in these cases. At the conclusion of the operation the whole wound is disinfected with a 5 per cent. solution of chloride of zinc, and then iodoform is applied.

Greffrath's cases and results lead him to consider the question of operating on rectal fistulæ in phthisical patients. He concludes that:

1. There is a causal nexus between tuberculosis and rectal fistula, but tuberculosis does not contra-indicate operation on the fistula.

2. Fistulæ form in diabetics on account of inflammation of the cellular tissue, and patients suffering from rectal fistulæ should have their urine examined for sugar.—*Deutsche Zeitschrift für Chirurgie*, Bd. 26, Hft. 1 and 2.

ANTHRAROBIN IN DERMATOLOGY.—Anthrarobin is a product intermediate between chrysarobin and pyrogallic acid, superior to the second, and without the inconveniences of the first. It is a yellow powder, soluble in 10 parts of pure glycerine and in 5 parts of absolute alcohol at 100°, and more soluble in the latter in the proportion of 1:2 at a temperature of 15° C. When applied to the skin it colors it yellow, and causes a slight sensation of dryness.

According to Liebermann and Behrend it is used by bathing the affected part with the alcoholic tincture or with a 10 per cent. glycerole, and inunction with a 10 to 20 per cent. pomade. Its application should be preceded by bathing the affected part with an alcoholic solution of potash soap. Its indications are those of chrysarobin. In psoriasis it is applied by friction with a brush, after removing the crusts. In herpes touserans Behrend claims that it is equal to chrysarobin.—*Revue Gén. de Clinique et de Thérap.*—March 22, 1888.

CREASOTE IN PHTHISIS.—VON BRUNN has treated 1700 cases of phthisis with creasote in 8 years, and with good results. The cases were both ambulatory, in which there was but little rise of temperature, and cases of active tuberculosis. The best results were had in acute cases in which the temperature became almost stationary after a period of fever, and in which, as a rule, the lesion was catarrhal and unilateral. Von Brunn thinks it unwise to give less than 6 or 7 ♏ of creasote a day; he has not given more than 7 ♏, and thinks it necessary to continue treatment for several months. The more creasote the patient can bear, the better, he thinks. He uses the the creasote wine originally prescribed by Bouchard:

Creasote	13	parts.
Tr. gentian	30	"
Alcohol	250	"
Tokay or Malaga wine *ad*	1000	"

One teaspoonful well diluted with water three times a day.—*Berlin klin. Wochenschrift*, Feb. 20, 1888.

ITALIAN TREATMENT OF PULMONARY TUBERCULOSIS.—PROF. ENRICO DE RENZI (*Il Morgagni*, abstract in *Centralbl. für d. gesammte Therapie*, February, 1888), passes under review the influence of creasote by the stomach and by inhalation; of iodoform, turpentine, iron, sulphuretted hydrogen, sulphurous acid, etc., by inhalation, and of the gaseous rectal injections.

Excellent results were had from the iodoform inhalations, and also from sulphuretted hydrogen. Creasote in considerable doses greatly lessened the bronchial muco-pus and the purulent matter of cavities, and exercised a favorable influence over the general nutrition. The following formula was used:

Creasote (pure)	5	parts.
Alcohol	100	"
Balsam of Peru syrup	"	"
Water	"	"

Dose, 1 tablespoonful.

The rectal gas injections exercised a favorable influence on cough and expectoration, but had no effect on the existing pulmonary lesions.

He concludes that the most clearly curative effects are obtained by large use of iodine and iodoform.—*Amer. Jour. of the Med. Sciences*, April, 1888.

STOPPAGE OF THE NATURAL FLOW OF URINE, says ULTZMANN, may be caused by:

1. Occlusion of the smaller urinary tubes, as in cholera and any of the renal diseases.

2. By occlusion, twists, and turns in the urethra.

Ultzmann records the case of a man, æt. 43 years, with calculus of the kidney, who suddenly developed anuria, which caused death in two weeks. The autopsy showed a cyst of the left kidney as large as a goose-egg, with obliteration of the ureter, and on the right side an enlarged kidney, with three small stones filling the ureter.

3. By a tumor of the bladder.—*Internat klin. Rundschau*, Nos. 9-17, 1887.

OINTMENT FOR SCABIES.—LASSAR uses the following ointment:

Naphthol, grm.	5—10
Gum soap	
Precipitated chalk	
Washed sulphur	
Lonolin ää grm.	25.

—*Jour. Cutan. and Genito-Urinary Diseases*, February, 1888.

THE
Journal of the American Medical Association.
PUBLISHED WEEKLY.

THE EDITOR OF THIS JOURNAL would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor.

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SATURDAY, APRIL 14, 1888.

THE PUBLIC AND PUBLIC HEALTH.

Desired advances in public health reforms and legislation can scarcely be hoped for in a country of universal suffrage until the public, and especially the leaders of the public, are educated up to the point of knowing what public health, in its broadest sense, means, and until it is made plain to them that the whole matter may be reduced to one of dollars and cents. Business men are always ready and willing to listen to any one who can show them how dollars and cents may be made and saved. The public press, recognizing this fact, is always willing to publish anything that will show people how to save or make money.

But the public and the press want something more than ambiguous statements; they want facts and figures, that carry conviction on their face. It is not enough to tell them that certain sanitary reforms and measures have saved lives and money to a country; they want to know how many lives, how many years of aggregate life, and how many dollars. *Populus vult decipi* is a hackneyed and often untrue saying. People do not wish to be deceived. In the majority of cases in which they are deceived, they act on the best of their knowledge and belief; they have not been taught what is best for them, and pursue the wrong path because they cannot read the sign-board that is so plain to the more fortunately educated

Public health legislation and medical legislation have been and are difficult to secure by popular vote because the people are inclined to look upon such as class legislation. An example of this tendency may be found in the *Congressional Record*, of March 27, in the ten-page debate on the anatomical bill for the District of Columbia. The members of the House that opposed it showed, by their objections and the foolish amendments offered for the purpose of making the bill non-operative, or of killing it, that they regarded it as a piece of legislation entirely for the good of the medical profession, and hence for the detriment of all other classes of people. Such ideas are fostered and disseminated by the public press, especially in new countries, and in the newer and more recently civilized parts of new countries, where an assumed title of "Professor" carries more weight than utterances of modest wisdom. Members of the press seem to reason as follows: People that advertise in our papers are wise, good and honest; reputable physicians do not advertise; *ergo*, reputable physicians are not wise, not good, and not honest. Scarcely a month passes in which every one of the newspapers of this city do not publish, editorially or otherwise, spiteful and malicious articles concerning the medical profession, thus following in the footsteps of a notorious Chicago journalist, sometime deceased, who was known to be insane for years before his death. In regard to the matter of advertising in newspapers, it does not seem to have occurred to the writers to find out why reputable physicians think such advertisements improper, and why they must in the end, be detrimental to the public.

As was said at the outset, the public and the leaders of the public must be educated up to the point of knowing what sanitation and public health mean. But how are they to be taught? One may hire a hall and lecture. By this method, however, only a very small minority of the public are reached. It is through the daily press that the public is best reached. As a rule, however, the daily press will not give space to such information. It does not contain the details of a triple murder, or a scandalous divorce case; it is not "taken from the diary" of some ignorant detective or policeman, that probably never kept a diary; it has no information concerning prize fights and base-ball games; and, a fatal objection, it gives no opportunity for publishing a bad wood-cut of some notorious woman or thief. With these objectionable and even fatal defects, an article on any subject relating to public health is not considered "news" by the *Palladium of our Liberties*.

Some time since the Agricultural Department of Wisconsin University published the results of an elaborate series of experiments on the feeding of

pigs. The publication was sent to a large number of papers, both in this country and England. Not a single paper in North America gave as much as one column to a review of the experiments. An English paper, on the contrary, gave more than a page to the subject.

The newspaper is the best medium for the dissemination of knowledge among all classes because it is cheap. If, on the one hand, one ask the editor of a daily newspaper why he does not print what will teach the public and give it information, he promptly replies that teaching is no part of the business of a newspaper. If, on the other hand, one be asked, what is *the* great means and medium for instructing the public? he answers, just as promptly and positively: "The daily press."

There are some papers that, at intervals, attempt to discuss scientific matters, sanitary, medical, and others. Just about as often as these attempts are made, however, facts are so misstated and distorted (generally unintentionally) that what is written has no value. It would seem that an editor that had any desire to give facts would have such articles written by men competent to write on these subjects; in which case well-informed men would not be disgusted, and the general public would not be misinformed. This is done to a very large extent in England and on the Continent, and when articles of this kind appear in such papers as the *London Times* they are generally of such a nature as to carry conviction. There is no more important field for a great daily newspaper to work in than that of informing its readers on public health matters.

But how can a newspaper consistently preach public health in its editorial columns, and at the same time sell advertising space to quacks? Long usage and experience shows that consistency is not among the jewels that may be owned by a newspaper. And it may be said that sanitarians should be tolerably well satisfied if the papers would begin to pay some attention to public health matters. As the matter now stands, so soon as any one begins to agitate for sanitary legislation, the public and the newspapers cry out that the doctors want something for themselves. They may be informed, however, that all the doctors ask for themselves is that the public will be more prompt in paying their doctors' bills.

EXTIRPATION OF THE LARYNX.—On February 19 PROFESSOR CACCIOPOLI, of Naples, performed the 13th extirpation of the larynx in Italy—for sarcoma of the larynx.

ŒSOPHAGOTOMY FOR FOREIGN BODIES.

In the *Deutsche Zeitschrift für Chirurgie*, Bd. xxv, S. 565, 1887, GEORG FISCHER, of Hanover, published a list of 80 cases of œsophagotomy for foreign bodies, with remarks on the general indications as to treatment. He has recently (*Deutsche Zeitschrift für Chirurgie*, Bd. xxvii, S. 273, 1888), republished his list, stricken out one case, and added 29 published and unpublished cases, making a total of 108 cases from which to draw conclusions. Of these Germany furnishes 26, Great Britain 20, North America 19, Austria 12, France 10, Italy and Russia 10 each, Denmark 3, Switzerland, Belgium and Holland 2 each, and Spain and Asia 1 each. Of 100 cases 67 were male and 33 female. In 6 cases the foreign bodies stuck in a stricture of the œsophagus, 5 of these in Billroth's clinic, 1 of which was twice operated on (in 1878 and 1885). Between 1738 and 1870, 31 œsophagotomies were performed, and 17 since 1870.

Taking out a case of œsophagotomy in which gastrotomy was subsequently performed, with a fatal result, 107 operations give 79 recoveries and 28 deaths, a mortality of 26.16 per cent. A study of the cases as regards the time that elapsed between the impaction of the foreign body and the operation shows that the mortality of operations done during the first two days is about 5 per cent. less than between the third and sixth days (inclusive), and that the mortality of operations done during the first three days is about 15 per cent. less than between the fourth and eighth days (inclusive). Of 70 operations done during the first eight days 27.14 per cent. were fatal; but of 9 between the first and fifth week 22.22 per cent. were fatal; and of 14 done after the lapse of months or years 21.42 were fatal. In regard to the age of the patients, the mortality of 9 operations between the ages of 10 and 20 years was *nil;* between 20 and 30 (18 cases) 11 per cent.; between 30 and 40 (21 cases) 28 per cent.; between 1 and 10 (12 cases), 40 and 50 (12 cases), and 50 and 60 (6 cases) 33 per cent., and between 60 and 70, 80 per cent. The youngest patient was 11 months old (died). One child of 16 months, 2 of 2 years, and 4 between 3 and 8 years recovered, though 1 had 20 epileptic attacks within 24 hours after the operation. The oldest patients were a woman of 70 (died), and a man of 74 (recovered).

In regard to the nature of the foreign bodies, 34 operations to recover false teeth gave a mortality of 20 per cent.; 33 for impacted bones of various kinds gave 33 per cent. of deaths. Of 7 operations for impacted coins 1 died. All the cases in which fruit

stones (6 cases), needles (5 cases), and fishbones (2) were operated for recovered. Two operations for stones gave 1 death. These were the foreign bodies that indicated the operation more than once.

Fistula after operation occurred in Cheever's first three cases, but the fistulæ, caused by reopening of the wound, closed again. Of the fatal cases, 12 were caused by ulceration, perforation, or gangrene, with involvement of the posterior mediastinum, burrowing of pus into the pleura, stomach, and to the base of the skull, and to pneumonia and pulmonary gangrene; 6 deaths were from hæmorrhage, 5 from exhaustion, 1 each from sepsis, pulmonary œdema, tuberculosis, and pulmonary trouble. In regard to the deaths from hæmorrhage (6), in half of them the foreign body wounded an artery, and hæmorrhage took place from the mouth or into the larynx and lungs. No fatal hæmorrhage occurred during an operation. In 3 cases the hæmorrhage occurred during the after-treatment, from unknown cause; in 1 case the ascending cervical artery rupturing on the eighth day, in 1 case presence of a drainage-tube, with the assistance of a 5 per cent. solution of chloride of zinc, caused hæmorrhage from the common jugular, and in 1 case the thyroid cartilage was most probably wounded by the stomach tube. Exhaustion carried off a 3 year old child, 3 patients between 60 and 70 years, and a man that had had a set of teeth in his œsophagus for 12 years. The case of pyæmia occurred in Nussbaum's service in the Munich Hospital in 1868, "when pyæmia was the order of the day."

The indications given by Fischer for the operation are as follows: 1. A recently swallowed foreign body must be removed by œsophagotomy, in case the bloodless method fails up to the end of the day after it was swallowed. Tracheotomy must be performed for threatened asphyxia. 2. If the foreign body has been impacted for some days one trial may be made with the bloodless method, and if this fail œsophagotomy should be performed immediately. 3. If the nature of the foreign body be such that any attempt at extraction or to push it down is dangerous, operate immediately. 4. When infiltration of the neck already exists, or when hæmorrhage has taken place from the mouth, œsophagotomy must be done at once. These indications presuppose that the surgeon sees the patient early. As a rule, however, the patient goes from one physician to another, each one attempting to remove the body, until finally, possibly after the lapse of days, the patient goes to a hospital. Precious time has been lost, the œsophagus has been injured, perhaps perforated, and the favorable time for operation is past. The physician, should he not wish to operate, should send the patient to a surgeon without making more than one or two attempts to remove the body.

Of the technique of the operation, and of the after-treatment, something may be said. The diagnosis and location of the body may be rendered uncertain by enlarged or softened glands (case of König), or an abnormally large carotid tubercle may cause an error (case of Esmarch). It must be remembered that the body may slip into the stomach during anæsthesia on account of the now relaxed condition of the œsophagus. The body may be too large to remove through the incision; Lawson had to cut a set of teeth in two with bone-forceps in order to remove them. It does not seem advisable, according to Fischer, to lay down any rule in regard to whether the œsophageal wound should be sutured or not. If the suture be used berhaps it is best to use isolated sutures, first used by Colin on animals, and recommended by Terrier. As to feeding the patient, Fischer says: 1. Every patient with a suture in the œsophagus should take fluid food a few hours after the operation, but should not be fed with an œsophageal tube. Exceptions are cases of incomplete and very painful deglutition and extreme exhaustion of the patient. 2. Under the open treatment of the wound the patient should be fed at first by means of a tube carried into the stomach through the wound.

PREVENTION OF DIPHTHERIA.

In complying with the request of a correspondent, in THE JOURNAL for March 31, 1888, we gave as the formula for *preventing* diphtheria "an abundance of pure air, good water, wholesome food, clean soil and a clean personalty." Now we are asked by another highly esteemed correspondent, whose letter can be found in another column, whether we have not "accidentally given the wrong formula." And he suggests as the "correct formula for the prevention of diphtheria . . . *isolation* and *disinfection*." In reply, we ask whether our formula was a mistake, or whether our correspondent has mistaken the object for which our formula was given? If the conditions given in our formula actually exist in any community or household, what can our sanitarian find to *isolate* or *disinfect*? The coexistence of the conditions being established, the only thing necessary is to maintain them *in statu quo* by preventing the introduction of infection or cases of infectious disease: as the pres-

ence of either at once destroys the conditions demanded by our formula. But if the air, water or food are allowed to become contaminated by the presence of infectious persons or things the primary question is not one of prevention, but of how to get rid of what already exists? In answering this question, the formula of our correspondent becomes appropriate, *i. e.*, isolate the infectious person and disinfect or purify all the infected *surroundings*, until the conditions of purity required by the formula for prevention are restored.

MEDICAL GRADUATES IN FRANCE.—From 1882–83 to 1886–87, inclusive, the six diploma-granting faculties of France graduated 3057 students. Bordeaux graduated 378, Lille 76, Lyon 242, Montpellier 338, Nancy 104, and Paris 1919. From 1882–83 the number of graduates steadily diminished from 662 to 546; in 1886–87 the number rose to 624, but in this year 99 diplomas were granted, under the new organization of the *service de santé*, to members of the *corps de santé* of the marine, leaving 525 diplomas granted to actual students of medicine, which is proportional to the diminishing ratio of the preceding sessions.

PRIZES OF THE LOMBARD INSTITUTE.—For 1888: A well demonstrated discovery in the treatment of pellagra, or on the nature of contagious miasms (2500 francs). Memoir to be deposited before December 31. For 1889: 1. History of hypnotism; critical examination of questions relating to it, with personal experiments (1500 francs). To be in hand before April 30, 1889. 2. Original researches on the embryology of the nervous system of mammifers (2000 francs). 3. Show some point in the macroscopic and microscopic anatomy of the human brain (2000 francs).

MAL PERFORANT AND SPINA BIFIDA.—Kirmisson published (*Bulletin Médical*, Sept. 7, 1887) a case of perforating ulcer which he ascribed to spina bifida. S. Bonandi (*Gazette degli Ospitali*, March 21, 1888) also publishes a case confirmatory of Kirmisson's case, and concludes that it is at least plausible that the arrest of development of the vertebral column and the dystrophy of the spinal cord is the primary cause of mal perforant in cases of spina bifida; and that these cases support the theory of the nervous origin of the foot affection.

LIEBERMEISTER and ERB have both declined the Chair of Clinical Medicine in Leipzig made vacant by the death of Wagner.

SEVEN AMERICANS attended the chemical laboratory of Prof. Fresenius in Wiesbaden this session, out of a total of 75 students.

A MEDICAL SCHOOL FOR CHINESE was opened in Hong-kong last October.

ASSOCIATION ITEMS.

The following additional titles of papers to be read at the approaching meeting have been received since the programme was published in the issue of THE JOURNAL for April 7:

Section on Practical Medicine.

"The Unity of Tuberculosis," by J. H. Musser, Philadelphia.

"My own Clinical Experience in the Administration of the Iodide of Potassium in the Treatment of Syphilis," by Morris H. Henry, New York.

"Obstinate Hæmaturia and its Treatment, by H. D. Didama, Syracuse.

Section on Obstetrics and Diseases of Women.

"Treatment of Acute Peritonitis," by William H. Myers, Ft. Wayne, Ind.

"The Value of Galvanism as Applied by Apostoli in the Treatment of Fibroid Tumors of the Uterus, with Cases," by Franklin H. Martin, Chicago.

Section on Diseases of Children.

"Membranous Croup and Laryngeal Diphtheria; Are they Identical?" by I. N. Love, St. Louis.

Section on Surgery and Anatomy.

"On the Radical Cure of Varicocele Attended with Redundancy of Scrotum," by Morris H. Henry, New York.

Section on State Medicine.

AMENDED LIST.

At the coming meeting of the American Medical Association at Cincinnati, O., May 8, 9, 10 and 11, papers are expected before the Section on State Medicine, as follows:

FIRST SESSION, TUESDAY, MAY 8.

Address by the Chairman of the Section, "Recent Advances in State Medicine," by Henry B. Baker, Lansing, Mich.

"Should the National Government Defend our Ports Against the Invasion of the National Enemy, Contagious Disease?" by Benjamin Lee, Secretary of the State Board of Health, Philadelphia, Pa.

A paper (title not yet learned) by J. N. McCormack, Secretary of the State Board of Health, Bowling Green, Ky.

"Cremation of Garbage," by J. Berrien Lindsley, Secretary of the State Board of Health, Nashville, Tenn.

"House Drainage," by Joseph Edwards, Philadelphia, Pa.

SECOND SESSION, WEDNESDAY, MAY 9.

A paper (title not yet learned) by E. O. Shakespeare, Philadelphia, Pa.

"Personal Prophylaxis Against Malarial Disease," by Geo. H. Rohé, Baltimore, Md.

"Atmospheric Temperature and Intermittent Fever," by Henry B. Baker, Secretary of the State Board of Health, Lansing, Mich.

"Abstract of Laveran's Researches on the Hæmatozoon of Malaria," by S. T. Armstrong, U. S. Marine Hospital Service.

"The Internal Origin of Fevers," by J. A. Larrabee, Louisville, Ky.

"Uniform Medical Practice, Report by a Committee of the Association," by Perry H. Millard, Ch'n.

THIRD SESSION, THURSDAY, MAY 10.

"Recent Discoveries and Researches with Regard to a Common Cause of certain Infectious Diseases," by C. W. Chancellor, Secretary of the State Board of Health, Baltimore, Md.

"The Causation of the Essential Fevers," by Victor C. Vaughan, Ann Arbor, Mich.

"Hygiene of Infancy and Childhood," by T. B. Greenley, West Point, Ky.

"Eastern Carolina as a Residence for Tuberculous Patients," by J. M. Baker, Tarboro, N. C.

"The Duty of the State and of the American Medical Association to Consumptives and their Medical Advisers," by J. E. Woodbridge, Youngstown, O.

Each paper should take twenty minutes, and there should be discussion after each paper.

If those who are to contribute papers see any error or omission in the title as here given, they will confer a favor by notifying the Secretary of the Section, S. T. Armstrong, M.D., Marine Hospital Service, New York, or the undersigned,

HENRY B. BAKER,
Chairman of the Section on State Medicine, American Medical Association, Lansing, Mich.

SOCIETY PROCEEDINGS.

ST. LOUIS MEDICAL SOCIETY.

Stated Meeting, March 3, 1888.

THE PRESIDENT, Y. H. BOND, M.D., IN THE CHAIR.

DR. I. N. LOVE read a paper on

THE PRACTICAL APPLICATION OF GLYCERINE.

There is no one disturbance that superficially viewed, seems so trivial, and yet which may be the cause, directly or indirectly, of such positive injury to the human anatomy as constipation. In infantile life, and during all ages, particularly among women, it is a prevalent disorder. The number of cases of hæmorrhoids, prolapse of the rectum, fissure and fistula of the anus, not to speak of the cases of fever due to absorption of ptomaines, all traceable to constipation, cannot be computed. Any procedure that promises relief for this dire disturbance should be thoroughly tested, and if efficacious, adopted.

In the *British Medical Journal*, of December 24, 1887, Dr. Julius Althaus reports, with the endorsement of his own experience, a procedure recommended by Anacker for the relief of habitual constipation, viz., the injection by means of a small glass, or hard rubber syringe, of a teaspoonful of glycerine into the rectum. An evacuation of the bowels usually occurs immediately, or within a few minutes.

The rationale of its action given by Anacker is that glycerine, in consequence of its pronounced affinity for water, when placed within the rectum, abstracts moisture from it, causing hyperæmia and irritation of the sentient nerves of the rectum, which leads reflexly to active and prompt peristaltic contractions, ending in defecation. The greater the accumulation of fæcal matter in the rectum, the more decided the effect. There is no unpleasantness or pain, but the action takes place *cito, tute et jucunde*. Sometimes a little fulness and throbbing is felt in the rectum for a few minutes afterwards

Althaus expressed the opinion that this plan, on account of its simplicity and readiness, would be found to constitute a veritable improvement in the therapeutics of constipation. The simplicity and practical value of the idea impressed me the moment my eye fell upon the article of Althaus, and I demonstrated its value within an hour, and from that time to the present, a period of over six weeks. I have applied it many times daily where the conditions suggested it, and no matter what the age, or degree of constipation, the response has been uniform and prompt. In a large number of infants and mothers where habitual constipation had been present from the birth of the former the remedy produced instantaneous relief, and coupled with broken doses of the mild chloride to stimulate the secretory system, I believe it furnishes a key to unlock the constipated condition which can be depended upon. I have directed the use of the glycerine injection at a definite hour each day, and have succeeded in establishing regularity in almost every instance.

There is no question about the securement of an evacuation almost immediately after the glycerine injection. The main point in order to obtain a result that will be lasting in character is to impress the patient or attendant with the importance of giving the injection at a certain time each day. In a few cases of piles and severe rectal irritation accompanying constipation, both conditions were more satisfactorily relieved by the glycerine than they had been previously by purgatives and sedative ointments. This remedy is a valuable one in being efficient, simple and convenient. It is surprising that some one had not thought of and applied it before.

Apropos to this subject, Dr. Edward R. Mayer, of Wilkesbarre, Pennsylvania, reports in the *Medical News*, of February 25, the use of an injection of two fluid ounces of warmed glycerine through a large flexible rectal tube, inserted at least seven inches, for the relief of intestinal obstruction due to paraly-

sis of the muscular coat of the bowel, superinduced and accompanied by peritonitis. All other means for securing an evacuation of the bowel having failed, Dr. Mayer having been uniformly successful in the application of the Anacker-Althaus plan of using glycerine, it suddenly occurred to him to extend and amplify the method as above stated. The insertion and the injection produced no distress or immediate effect, and he left the invalid with directions to her nurse to cause the hips and knees to be elevated for a time. Upon his return after several hours, he found a greatly changed condition of affairs, comfort where their had been agony, and an anxious and pallid countenance replaced by beaming smiles and hopeful expression.

He was informed that within ten minutes after the administration of the glycerine enema, the patient felt a warm thrill and glow extending itself and permeating all through her intestines, followed by the vermicular movements which precede peristalsis, by audible and sensible displacements of gas, and finally by acute colicky pains. Within twenty minutes after the injection, there was an urgent call to stool, with the result of the escape of a large amount of flatus, and later, of a pint of semi-liquid evacuation of mingled yellow and green color, with some small scybalæ and a very pronounced odor. This evacuation was succeeded in an hour by another of a similar character. Considerable tympanites and tenderness still existed, but the abdominal distention was decidedly reduced, and the distress greatly relieved. The temperature, which had been kept depressed to about 100° by the antipyrin, soon fell to 99°, and the thready, jerking pulse of 120 had descended to 100, and the next day was not above 90, becoming rapidly soft and full. The nausea abated, and in a few hours disappeared and did not return.

Enemata of warmed glycerine to the extent of two ounces each, were now administered night and morning during the next three days, each one resulting in a copious fæcal evacuation, at first liquid, and then formed. The temperature varied during several days between 99° and 99.6°, the pulse soon dropped to 80, the tenderness gradually disappeared, and the distention slowly melted away. Milk punch, beef-tea, and revalenta arabica were greedily taken in small quantities, retained and digested, and upon the ninth day of the illness, the patient, while feeble, was entirely convalescent, a salutary diarrhœa having set in after the enemata were discontinued, and soon ceasing. The only drug treatment employed after the symptoms improved, was a single very small dose of a saline laxative and a nightly hypodermatic of six minims of morphia solution, to secure rest.

The result in this case was extremely satisfactory, and very important in its suggestion of possibilities.

Dr. Mayer further says: "If glycerine, injected by the method described, does really penetrate and permeate the upper colon or even the small intestine, it remains to be ascertained whether drugs combined with it as their vehicle, would measurably remain in the site to which they would be conveyed, or would be too completely washed away and extruded by the pouring out of large quantities of liquid, and by the violent expulsive efforts of the muscular coat of the intestines to exert their specified influence. Should it be that any considerable portions of such drugs would remain *in situ*, it is manifest that an improved method of internal medication is near at hand, and that such drugs as antifebrin, antipyrin, aloin, belladonna, calomel, croton oil, colocynth, ergotin, hydrastia, hamamelin, naphthalin, physostigma, the terebinthinates, and even nitrate of silver, and some of the germicides may be introduced by an entrance into portals hitherto closed to them excepting by a devious journey through the ordinary avenues. He would be a rash man who, with our present knowledge, should attempt to sterilize typhoid bacteria by a direct attack upon the agminate glands, but stranger things than this have happened, particularly of late, in the direction of gaseous rectal medication."

DR. ROBERT BARCLAY: I am glad to hear the doctor's testimony added to that which already exists as to the efficiency of glycerine as an aperient. He speaks of its use by rectal injection, which to my mind is a very disagreeable method of administering it, except in the case of helpless patients, where there are large fæcal accumulations, or in very young infants. The aperient properties of glycerine have been known for years; it has been in use as a adjuvant to other aperients. It has been my custom to prescribe castor oil and glycerine, in equal parts—an ounce of each—with a few drops of oil of wintergreen added to give a pleasant flavor. This often has a good effect where castor oil alone will not answer. I give it by the mouth and not by the rectum. It is just as well to give it in an agreeable way and by the natural passage.

DR. DEAN: I had occasion to treat some cases of oxyuris vermicularis, and I used glycerine with good effect. I related this to Dr. Hermann, of this city, and sometime afterward he brought me two children who were troubled with oxyuris vermicularis, they were little girls, and the worms had gotten into the vagina, which is frequently the case. And he used glycerine in these cases with good effect. I advised him to be careful in the use of glycerine, however, but he got an excellent result. I have often seen the good result of the use of glycerine injected into the rectum of children for this trouble. The worms shrink and shrivel up, and it is only a few minutes until the bowels are emptied of the worms. The astonishing feature to me is that the beneficial effect of glycerine in the condition mentioned by Dr. Love has not been discovered before. I have for many years used glycerine injections for these worms that I have mentioned, but it is only within a few days that I saw this use of glycerine in constipation suggested.

DR. FRANK GLASGOW: Some years ago I read an account of a series of experiments which had been instituted by some Frenchman, who made various applications of medicine to the surface of the body for the purpose of determining whether they would be absorbed or not. He found that remedies in glycerine solution were not taken up

into the blood. This is probably because there is an exosmosis going on, of the watery particles of the blood, to the glycerine. It occurred to me that this was the same process which caused the result, which Dr. Love mentions; and if so it seems to me it would render inoperative the use of glycerine *per rectum* as a vehicle for the conveyance of systemic remedies.

DR. LOVE: The suggestion which Dr. Glasgow has made is a very good one, and it is probable that the use of glycerine for the purpose suggested by Dr. Meyer would be contra-indicated. I want to say that Dr. Barclay failed to grasp the main idea in the paper; that is that the glycerine by injection on account of its affinity for water produces an irritation of the sentient nerves followed by a peristalsis, and this secures a prompt action, the impulse being given from below upward securing a prompt effect. The administration of glycerine by the mouth has no bearing on the subject whatever.

MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA.

Stated Meeting, December 7, 1887.

THE PRESIDENT, JOS. TABER JOHNSON, M.D., IN THE CHAIR.

DR. P. J. MURPHY read the history of and presented the specimen of a case of

HYDATIDIFORM MOLE.

Mamie H., colored, æt. 18, single, first applied at Columbia Hospital Dispensary for, as she expressed it, "womb disease," Feb. 9, 1886. She began menstruating at 13 years and for the following two years she had no difficulty with the flow. She then became irregular, being unwell two or three times a month, and again seeing nothing for six or seven weeks. She suffered intense pain at every menstrual epoch and usually the flow was profuse. Now has a great deal of pain in back and a feeling as if her insides were coming out below. She has a profuse leucorrhœa, otherwise feels all right. At the request of her accompanying relative and herself an examination was made. The vagina was found to be quite capacious and the uterus was of about normal size. There was marked retroversion and retroflexion of the uterus and its cervix was close under the pubes; the anterior fornix of the vagina was obliterated. She continued about the same, working in the capacity of household servant, and was admitted to the hospital June 22, following. The uterus was now found enlarged, slightly, and prolapsed; posterior lip of cervix elongated and anterior lip occupied by a hard mass about the size of a hickory nut. July 7, after some paroxysms of pain she passed off "something" that upon examination proved to be a fœtus of about 5 weeks development. She was discharged from the hospital August 24, feeling excellent. She was not again seen until she presented herself again at the outdoor service of the hospital, August 9, 1887, complaining of considerable nausea and vomiting, constipation, loss of appetite, and very much worried about her "courses." She had been irregular and profuse during the spring, had been unwell three times in June and had not seen anything in July. At this visit her breasts were swollen, deeply pigmented about the nipples and presented to view many of the enlarged papillæ known as Montgomery's tubercles. The uterus was very much enlarged, extending about half way up to the umbilicus, and was quite soft. Knowing her previous history, pregnancy was suspected. October 14 she again returned and stated she had been confined to bed, had been unwell three weeks, and was still flowing. She was requested to keep quiet in bed and was given 20 grains of potassic bromide three times a day. November 1st, presented herself, saying she had been unwell three days and was in a bad way. Abortion was suspected, and an examination made. A mass of hydatidiform cysts was found protruding from the vulva and extending into the uterine cavity. As much of it was removed as possible without entering the cavity of the uterus. The patient was readmitted to hospital, put in bed, and given a hot carbolized douche. Some slight hæmorrhage with passage of shreds occurred for two or three days, and she was given 25 drops of aromatic sulphuric acid three times a day. November 6 she was etherized for examination. There was marked resonance on percussion all over abdomen; uterus not felt above pubes by external manipulation. Cervix uteri small; uterus enlarged and thrown forwards, and its cavity measured four inches in length; some slight bloody discharge; the growth in the anterior wall of the cervix was still prominent; the index finger passed into the cervix as far as the internal os. She was given pil. ergotin comp. (Schieffelin), one three times a day. November 19, uterus about normal size and condition; patient felt well and was discharged from hospital.

She declared she had not had sexual intercourse since the date of her first admission to the hospital, June, 1886. This declaration may be false, yet it is possible it was true.

DR. T. C. SMITH: Dr. Murphy's specimen is interesting. It will be remembered that he presented a specimen and read the histories of two cases some time ago. The interesting point is whether the hydatid degeneration developed at the time of the pregnancy in 1886. The woman may abort one of a twin pregnancy and retain the other in a degenerated state. In such cases the question of chastity is at stake, and hence the importance of being careful in the expression of an opinion.

DR. D. S. LAMB read the history and presented the specimen of a case of

SENILE HYDROCEPHALUS.

(This paper will be published April 21.)

DR. ROBERT REYBURN read a paper on

ELECTRICITY IN SURGERY.

(See page 455.)

DR. FRIEDRICH: How long does it take to cure a tumor?

DR. REYBURN: One or two applications are made a week and the sittings are about ten minutes each.

DR. LAMB: Do the tumors always atrophy, or do they ever slough?

DR. REYBURN: The current decomposes the tumor.

DR. LAMB: In the case of the tumor of the neck would it not have been more satisfactory to have used the knife?

DR. REYBURN: The patient refused to submit to its removal with the knife. It was about the size of a small pear. His experience with the knife has been very poor, as such tumors are apt to return.

DR. LINCOLN was glad that this subject had been brought before the Society, as he had been greatly interested in it for some years, and during the past year has been employing it daily. His results have warranted its application in a variety of pathological conditions, and in some instances have been simply marvellous. In October, 1886, he was called to see a case of uterine fibroid of most formidable dimensions, in consultation with Dr. Bayne and the President of this Society. The patient, a lady from Florida, had been suffering from the tumor for several years, and for eighteen months had been rendered almost helpless by its enormous bulk, which rendered it impossible for her to put on her own shoes and stockings. The tumor filled the abdomen, reaching to the xiphoid cartilage, and she was as large as a pregnant woman at term. The whole length of the ordinary sound was lost in the uterine cavity. By an almost constant hæmorrhage she was reduced to an extreme degree of emaciation. It was unanimously agreed that operative procedures were out of the question, and the proposition by him to try the effect of electricity was accepted, and after weeks, during which hypodermatic injections of ergot were almost daily used, with the effect of diminishing the hæmorrhage, but not perceptibly reducing the bulk of the tumor, he applied the electric current. A Fleming battery of 40 cells was used. The positive needle, insulated to one inch from the point, was introduced through the abdominal walls at a point one inch below the umbilicus, so as to penetrate the tumor to the depth of three or four inches, while the negative needle was introduced through the vagina. The whole strength of the battery was gradually brought to bear, and continued for twenty minutes without any considerable pain. The introduction of the needle was not more painful than that of the ordinary hypodermatic needle, and no anæsthetic was used. The first application was, then, attended with no pain; it immediately arrested a copious hæmorrhage, excited by the introduction of the speculum; relieved a severe pain in the back which had existed for a long time; and produced in a high degree the usual sense of exhilaration and courage. Two similar applications were made subsequently at intervals of a week and ten days respectively, the needle being entered through the abdominal walls about an inch below that on the previous occasion.

The tumor, which was of great hardness, and with difficulty penetrated by the needle, was greatly softened by the first application. Subsequently in three or four applications a large electrode, 12 by 9 inches, was substituted for the positive needle. This gave more pain and was less efficient. After the first application, though the negative pole was used through the vagina, there was no more hæmorrhage, menstruation becoming normal in regard to time and amount. The circumference of the abdomen was in a few weeks reduced by four and a half inches; the tumor sunk to the level of and a little below the umbillcus, and was apparently not more than one-fourth its former bulk. The patient now feeling almost entirely relieved of her disabilities, became anxious to return to her family in Florida, and she soon after did. Since her departure she has continued well, and is as actively engaged in her domestic duties as ever.

Electricity often has a very exhilarating and tonic as well as an anodyne influence upon the nervous system. That may occur in cases where no local changes for the better can be hoped for *e. g.* in malignant disease.

Some 12 or 15 years ago, about the time Neftel reported several cases of cure of cancer, a woman was assisted into his office in the last stages of cancerous cachexia, from a scirrhus of the breast. He was at the moment using a Graves' battery of 60 cells in a couple of cases of progressive muscular atrophy, and the temptation to try its effects upon this otherwise hopeless case was great. Two needles connected with each pole of the battery were introduced into the opposite sides of the scirrhus mass, and a current from 40 cells—probably, as the battery was a very powerful one, of an electro-motor force of 200 milliampères—was continued for twenty minutes. Locally extensive sloughs were formed about the needles, the pain which had been intense was dissipated, and the progress of the disease was apparently arrested for two weeks. The next morning the poor woman, who the day before had been unable to walk except with assistance, met him at her door, busily occupied with her broom, and informed him that she was well. This condition of relief from suffering, renewed appetite and increased strength continued for some weeks when the patient again came for another application, which was given with a similar but less marked effect; but after this she gradually declined, suffering but little pain, until her death.

About the same time he treated a large recurrent sarcoma of the breast in the same way with the result of relieving entirely the pain, apparent arrest of the growth (previously rapid) for considerable time, when resort was had to cunderango by the patient who unfortunately died just before a cure by that agent was effected.

He has employed electricity in a large number of cases of chronic metritic and peri-metritic inflammation, accompanied with adhesions and exudations, with the best results. Neoplasms rapidly melt away under its use and pain is, for the time at least, almost instantly abolished. Indeed this wonderful relief from suffering through its agency is regretted by Engelmann as the patient is tempted thereby to believe herself cured before the essential organic restoration is accomplished.

Of course, electricity like all other valuable agents

will be used by enthusiasts when it is quite out of place. He remembers that the late Secretary of the Smithsonian Institution placed in his hands for review some years ago, a French journal in which a most ardent and sanguine Frenchman advocated the amputation of large limbs by the electro-cautery.

In suitable cases and with a competent knowledge of its nature and proper application, no one will fail to find electricity of inestimable advantage. The surgeon will find abundant occupation for his knife for ages yet to come, but many a man and many more women will have occasion to thank God for an escape from that last resort of an incompetent profession through the benign agency of this wonderful force. He would insist that all who propose to employ electricity should first learn something about it. With the works of Erb, Apostoli, Bartholow and the most elaborate and excellent paper of Engelmann in the Transactions of the American Gynecological Society at hand, there is no reason for ignorance on the subject. He would further insist on the importance of the use of the milliampère meter. The resistance of the tissues, particularly of the cuticle, varies so constantly that the meter is absolutely essential to the proper use of the current.

In conclusion he would say, without fear of contradiction, that no one who has ever intelligently employed this agent will ever abandon it, and that distrust of it exists only among those who have had no experience of its marvellous powers.

Dr. J. Ford Thompson said he felt as if he had lost his occupation and that there was now no use for the surgeon. As this was a surgical question he had something to say. Such methods are apt to be carried to extremes. One should not base his reputation on the cure of fibroid tumors of the uterus for they not infrequently get well without any treatment. A new treatment springs up and a few enthusiasts claim to cure all cases. At one times ergot was used for the radical cure, and for a time a great many physicians were running over with it, but its time was short. He had frequently seen these tumors get well after treatment had been suspended. In one case the woman was so large that she was confined to the bed and compelled to lie upon her back. She had had electricity, and he was called in to decide about an operation. He declined to operate and she got better without any treatment. How many malignant tumors are reported on good authority as being cured by electricity? He had never seen such a case in his practice. Sometime ago he was called to see a case of cancer of the breast that had been under the care of a specialist who had been applying electricity to it. He was summoned in great haste and found the woman bleeding to death. The breast was filled with a blood-clot; the skin had ruptured; and there was a fungus growth. He amputated the breast at once. Everything between the skin and the ribs was a mass of pulp resembling clotted blood and the arteries had ruptured. This was an extreme case with the intense application of electricity, but it did not get well until its removal.

Dr. Reyburn frightened the goitre away. Such growths are not cystic, and do not require any such treatment; in fact they often do better when let alone. He never operates in the condition to which Dr. Reyburn refers. He thought electricity an agent for good, but it is too apt to be abused by enthusiasts. A few cases of stricture of the rectum, treated by Newman, of New York, is worthy of mention. Dr. Thompson diagnosticated cancer of the rectum in a student of medicine. Drs. Agnew and Sands agreed with his diagnosis. He then went to St. Luke's Hospital, in New York City, where a young physician cut the stricture. The patient stayed in the hospital until the wound healed and then went to Boston where he was under treatment for sometime. He was almost insane and was sent to his mother in a deplorable condition. He heard of Dr. Newman and determined to try his treatment. Dr. N. applied electricity for several months. In about eight months a stout, healthy-looking man entered Dr. T.'s office but was not recognized. He said Dr. N. could introduce an electrode as large as a hen's egg. The rectum was dilated and there was a ring of hard tissue present, but the man was apparently healthy. He does not believe that this man has been cured but he is practically well and may live a useful life for many years. In large hospitals such cases are surgical curiosities.

Finally, he is willing to wait a little longer before he accepts electricity as a unversal panacea.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

The Vice-President, W. W. Keen, M.D., in the Chair.

Stated Meeting, March 14, 1888.

Dr. J. Madison Taylor read a paper on

THE EARLY RECOGNITION OF GRAVES' DISEASE.

(See page 452.)

Dr. S. D. Risley: I would like to ask Dr. Taylor whether there is any indication by which the development of exophthalmos can be expected in cases in which it has not yet appeared.

Dr. J. B. Roberts: I believe that the great ocular deformity which is so unpleasant to the patient, and attracts so much attention, can be remedied by a very simple operation: merely putting a stitch at the outer canthus, after freshening the edges of the lids, to diminish the optic commissure after the case has made such progress that it is reasonably certain there is to be no further diminution of the prominence of the eyeballs. The patient can be made more comfortable and less conspicuous.

Dr. Edward Jackson: The procedure suggested by Dr. Roberts might be resorted to for other than cosmetic reasons. I recently saw a case of this disease, with very great exophthalmos, in which one eye had been lost through sloughing of the cornea due to exposure; and I afterward learned that the second eye had been lost in the same way. Such an accident might be prevented by narrowing the fissure of the lids.

DR. A. V. MEIGS: I know of one person who has completely recovered from this disease, a woman who had a very severe attack many years ago, under the care of my father. The prominence of the eyes, which was very great, is now hardly noticeable, and yet no operation was ever done. I do not think much would be gained by sewing up the canthus, for while the disease is in its acute stage, it is hardly likely the operation would afford much relief, and later, if the patient recovers at all, the difficulty cures itself. I think I know the case Dr. Roberts had in his mind when he spoke, and Dr. de Schweinitz, who has seen the woman in question, will probably agree with me that nothing would be gained by an operation. One thing I have learned of recent years, and it is that it is not necessary in all cases to put the patient in bed. I could mention three or four cases I have successfully treated with tonics and proper regimen, without its becoming necessary to have rest in bed; the cases, to be sure, were not severe. Dr. Taylor speaks of the early recognition of the disease. For my own part, I do not see how a positive diagnosis can be made until we have at least two of the features of the disease present, namely, the cardiac palpitation and some thyroid enlargement; the prominence of the eyes occasionally does not manifest itself, but a diagnosis can undoubtedly be made in its absence.

DR. G. E. DE SCHWEINITZ: I have examined the case that Dr. Meigs refers to, and I saw nothing to be gained by surgery. The eyes were at first very prominent, but they were then receding, and now the normal relation of lids to eye-balls is restored. Inasmuch as there was considerable myopia, and hence not uncommon prominence of myopic eyes to begin with, they will always be more or less conspicuous.

DR. S. SOLIS-COHEN: I have been extremely interested in this valuable paper of Dr. Taylor's, the more so that I think I recognize in his first case a patient whom I have seen, but in whom I did not recognize this disease. She was treated at the Jefferson Hospital some three years ago for anæmia, and was apparently cured. A year ago she returned with the history of "fits" spoken of by Dr. Taylor, and was irregular in attendance and unreliable in statement; the hysterical element so noticeable, probably preventing the careful investigation the case should have received. I consider it the more remarkable that thyroid enlargement should have escaped notice at the clinic in this case, as the comparatively frequent discovery of it at one time, in cases of cardiac and vaso-motor disturbance, has put all the clinical assistants on the lookout for the phenomenon. I can thoroughly agree with Dr. Taylor that vaso-motor paresis plays an important part in the development, if not in the genesis, of this disease. The only case I have seen in the male subject occurred in a young man subject to frequent attacks of flushing of the face, sometimes accompanied with high temperature, in whom the rapidity of the heart's action had led to a diagnosis of hypertrophy of the heart, not warranted by physical exploration. The eyes were not involved at the last time I saw the patient, nor was thyroid enlargement sufficient to attract attention without special examination. I have now under my care in private practice a young lady not at all hysterical, subject to similar attacks of flushing which sometimes leave behind for a short time wheals like those of urticaria: who has also had two attacks of sudden transient blindness, after which all that could be detected in the fundus was moderate congestion; and whose cardiac action, rapid and irregular at these times, is at other times perfectly normal. No organic lesion of any kind has been detected either by me or by more competent observers. It is possible that this may be an early stage of Graves' disease. Improvement has taken place under minute doses of picrotoxin, a drug which Dr. Bartholow has prescribed in cases of exophthalmic goitre, at the hospital, with very good results. One case especially I recall which was associated with purpura. I would like to know whether Dr. Taylor has met with this association. A very interesting case of acute exophthalmic goitre presented at the clinic, which Dr. C. J. Wilson may remember as the subject of one of his clinical lectures; an anæmic young girl affected from childhood with nystagmus, in whom goitre and exophthalmos were asserted to have developed within a short time after a fall from a ladder. She was unable to button her collar, which friends had opened in attending to her after the accident.

DR. J. C. WILSON recalled the case mentioned by Dr. Cohen, but not with sufficient distinctness to add anything of importance to the account already given. Dr. Wilson briefly narrated two cases of Graves' disease, recently seen in his private practice, in which the symptoms developed rapidly after mental shock. The patients were young women. The first, a servant, aged 24, of previous good character, was engaged to be married to a young man who was by occupation the driver of an ice cart. Within a day or two of a visit to her, he was accidentally killed, and her first knowledge of his death came through the newspapers. Cardiac overaction at once developed, and within a month thyroid enlargement, and slight exophthalmos. Under rest and large doses of Fowler's solution complete recovery took place in a year. The second case was that of a lady, aged 20, who rapidly developed the characteristic symptoms of Graves' disease after the shock and grief occasioned by the disappearance of a near and loved relative, and the discovery that he was a defaulter to a very large extent. The prominence of the eye-balls was in this case very slight; the other symptoms were characteristic. Under treatment by rest and arsenic decided improvement took place. It is now a month since she last reported.

DR. TAYLOR: In reply to Dr. Risley's query, Does any sign clearly foreshadow the exophthalmos? I can only say that I know of none, nor did I see anything in the literature of the subject to aid us. It usually marks the height of the disorder, though this may be the first feature noticed, especially when it arises suddenly as from shock or overwrought emotion.

DR. CHARLES B. NANCREDE read a paper on

THE IMPORTANCE OF PRIMARY SUTURE OF DIVIDED NERVES.

(See THE JOURNAL of April 7, p. 427.)

DR. H. R. WHARTON: I have seen one or two cases of primary nerve-suture, though none in which the injuries were so extensive as in this interesting case of Dr. Nancrede's. The results in these cases were good. There is another point to be considered: Shall we attempt secondary suture of the nerves when this has been omitted in the first place? I am very decidedly of the opinion that this procedure should be adopted, for a number of cases have been reported of this character in which the results have been, at least, good enough to make me feel that secondary suture should be attempted when there is any probability of restoration of the use of the injured part. I thoroughly agree with Dr. Nancrede as to the great importance of this subject.

DR. JOHN B. ROBERTS: The only case of nerve-suture I remember at present is one in my wards, in which the work had very properly been done by the resident immediately on the admission of the patient. It was a rather extensive incised wound of the leg, involving, I think, the musculo-cutaneous and anterior tibial nerves. The muscles and nerves were sutured and dressed antiseptically, and the results were good; though I did not follow the case after discharge so as to make an accurate report as to sensation. Dr. Nancrede has incidentally touched upon a point of great importance, that of teno-suture. It has been my misfortune to meet with quite a number of cases in which this had been neglected by the attendant called at the time of the accident. One of these recently seen was that of a man wounded in the forearm just above the wrist, and in the ring finger. There was loss of flexion of the finger, but it was hard to tell which of the wounds to reopen in order to come upon and suture the divided tendon. The family physician believed it to be the wrist; but after cutting down, I found the tendon here flaccid and intact. I then opened the finger-wound, and here found the tendon retracted into the sheath. I sutured, but did not get a good result, probably from the extent of dissection necessary to get at the tendon in the sheath, and the great mass of cicatricial tissue. However, I never hesitate to reopen healed or partially healed wounds to suture tendons when this very important measure has been neglected.

I have been glad to hear Dr. Nancrede say that with cleanliness of person and of instruments asepsis can be secured without chemical solutions. This is in marked contrast to one of my friends, a surgeon of prominence, who thinks that the employment of solutions renders care as to cleanliness unnecessary.

DR. J. WILLIAM WHITE: I do not know whether Dr. Nancrede spoke of the resection of the crushed and bruised ends of the nerves. The general principles of nerve suture are admitted by all surgeons, but the question of resecting lacerated or contused ends before suturing, or of allowing them to remain, is one that should be carefully considered in each case. On the one hand, by resection of any considerable portion we increase longitudinal tension, and make greater strain on the sutures; on the other, we run the risk of including in the stitches tissue too much damaged to recover itself. There is some difference of opinion as to the particular suture to be employed. I should think that the one proposed by Dr. Nancrede, as shown in his diagram, would be open to objection if, as there apparently represented, it interposes a foreign substance, the catgut thread, between the ends of the nerve; this, if not absorbed, as is sometimes the case even with the best catgut, is liable to be a constant source of irritation, and to prevent union. I prefer and employ a suture passing quite through the nerve above and below the point of union. Evidence, either clinical, or pathological, or experimental, as to the relative advantages of different sutures is desirable, but I do not know of any, and I did not understand Dr. Nancrede to say that there was such evidence.

THE CHAIRMAN: There are two cases I may briefly cite from my own experience in connection with the subject of our discussion:

1. A case of primary nerve-suture in a boy 2 years of age, with perfect recovery of motion and sensation. The case occurred ten years ago. The child, carrying a glass bottle, fell, and a fragment of glass divided the ulnar nerve and artery about 1½ inch above the wrist. The mother made compression with her thumb until I arrived, very soon after the accident. After ligaturing the artery, I examined the nerve and found that it had been divided. I had only my pocket-case containing coarse white silk and an ordinary needle. Not wishing to leave the coarse silk in the wound, particularly not in the nerve tissues, I debated as to the method of suture, and devised one which proved eminently satisfactory. Drawing the ends together closely with forceps, I passed a surgical pin obliquely through the two divisions, threw a loop of silk around the point of the pin (as in Simpson's method of acupressure), drew out the thread, passed it around the head of the pin, where it was secured. At the end of forty-eight hours the pin was removed. The thread was thus loosened and removed. Perfect union of the wound took place in a few days. There was no wasting of muscles, and motion was present after twenty-four hours. While the age of the child prevented exact observations as to the time at which sensation returned, at the end of forty-eight hours there was an exclamation of pain on pricking the little finger with a pin. I saw the father of the boy about a year ago, who told me that his son had perfect use of hand and fingers.

2. Extensive teno-suture with quick union. A recent case shows the value of even a brief suture of tendons. A man 25 years of age was admitted into St. Mary's Hospital with complete severance of all the tendons of the forearm and of the sheath above the wrist. The resident sewed each tendon carefully. He had only Kocher catgut, which does not remain more than three to five days, and then closed the external wound and placed the hand in flexion on a splint. The man left without permission after a few days, and it seems removed the splint and

tore out the sutures in the skin. He returned later with a gaping wound in the forearm, but on testing the fingers separately each finger and each joint was found to have perfect motion, showing that even this temporary apposition of the divided tendons had a perfect result. I should prefer for the purpose, however, either very fine silk or, better, the ordinary chromicized catgut.

DR. NANCREDE: Dr. White has misunderstood me. There is nothing between the divided ends of the nerve. If he will examine the rough model which I pass around he will see that the nerve is securely and accurately coaptated by the suture. I have no distinct recollection of resecting the injured ends in this case; in fact, I am nearly certain that I did not. In some cases I have said it *might* be desirable, but I am dubious about it. In two other cases that I recall at this moment, I remember that I did not make any attempt of the kind, but brought the ends together as best I could. Referring to the incidental discussion, I am glad to hear that so many of our members always suture tendons. I make it a rule to suture nerves and tendons in every case, and generally obtain fair results.

DR. HOWARD F. HANSELL presented a

CASE OF ECTOPIA LENTIS.

Clarence P., æt. 10. This colored boy presents several deformities: A peculiar shape of head, deviation of spine, anterior curve of each tibia, and is more or less undeveloped. I have asked him to present himself before the Society in order that those members who may be interested may have an opportunity to see a case of "ectopia lentis," congenital upward displacement of each lens. The margins of the clear lenses may be distinctly seen about the centre of each pupil. The right lens is dislocated upward, the left upward and outward. Each eye is highly myopic—*i. e.*, as seen through the lens, and hypermetropic as seen under the lens. The temporal side of each nerve shows a large patch of atrophic choroid — post-staphyloma. There is no coloboma of the iris or choroid. With the right eye the boy can read large print only when held 2½ inches from the eye in an upward and outward position. The left eye is useless.

NEW INSTRUMENTS.

TRACHEOTOMY RESPIRATOR.

BY THOS. F. RUMBOLD, M.D.,
OF ST. LOUIS.

On February 21, 1870, with the assistance of Dr. Wm. Neihaus, of this city, I performed tracheotomy on Mr. Wm. D., æt. 43 years. Immediately after he was placed in bed I had a large sponge, that was squeezed out of quite warm water, laid over the tracheal tube. This warmed and moistened the air as it entered the lungs, thus preventing the necessity of having the air in the room unduly heated and moistened, which is usually found beneficial in tracheotomy cases. While he was in the house he had the hot moist sponge on his neck all the time. In eight days he was strong enough to drive to his place of business, but was prevented by his inability to keep the sponge warm. As soon as he went outdoors and the sponge became cold the cold air produced an excessive cough and some pain in his lungs.

For the purpose of allowing him to have warm moist air all the time, and also to allow him to blow his nose—which gave him a great deal of trouble and much discomfort because of the presence of profuse nasal secretion—I connected the tracheal tube with a rubber tube, which he placed in his mouth. In this way the air from his lungs passed through his mouth, up behind the soft palate and out his nose. This enabled him to blow his nose as perfectly as he had ever done. During inspiration the air passed through his nostrils, mouth and rubber tube into his lungs through the tracheal tube, thus giving it nearly the normal degree of warmth and moisture.

Figure 1, Illustrating the application of an apparatus for conducting the warm and moist air from the mouth and nasal passages to the lungs in cases of tracheotomy. *a*, tracheal tube in place; *b*, short rubber tube connecting the tracheal tube with the secretion-trap; *c*, secretion-trap, to catch the muco-purulent secretion that is coughed from the lungs, and the condensed vapor from the mouth; *d*, soft rubber tube connecting the mouth with the trap and tracheal tube. In the trap *c* is a small bag of pulverized charcoal to deodorize the secretions.

It was found after a short trial that the muco-purulent secretion from the lungs, and the condensation of the moist air from the mouth and nose, as well as some saliva from the mouth, accumulated in the rubber tube, which when they passed into the trachea caused intense spasmodic coughing. For a few days he partially prevented this by clearing the rubber tube after taking it out of his mouth, by coughing through it rather forcibly. As it was quite difficult to cleanse the rubber tube of the muco-purulent secretion in this way I had a glass receptacle attached to the tracheal tube and the tube going to his mouth, so that the secretions were prevented from entering the tracheal tube.

I have called the apparatus a "Tracheotomy Res-

pirator." I have applied the same kind of an apparatus to other patients upon whom I have performed tracheotomy. In one case of malignant disease of the larynx, the patient's breath through the tube produced an intolerable taste. For the purpose of correcting this I put a small quantity of pulverized charcoal, tied in a small bag, into the glass portion, or what might be called the secretion-trap. This has a partially good effect.

Figure 1 illustrated the application of the apparatus. Figure 2 a section of the secretion-trap of the apparatus.

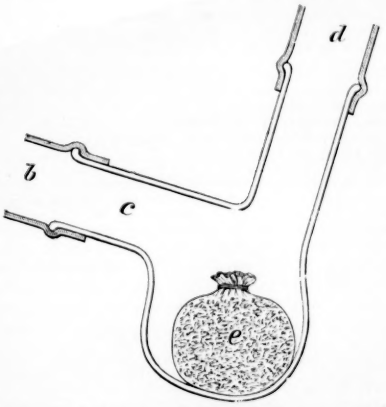

Figure 2, a section of the secretion-trap of the Tracheotomy Respirator. *b*, short rubber tube connecting with the tracheal tube; *c*, the secretion-trap: *d*, the soft rubber tube, which is about 7 inches long, that passes to the patient's mouth; *e*, a small bag of pulverized charcoal.

DOMESTIC CORRESPONDENCE

PREVENTION OF DIPHTHERIA.

Dear Sir:—On page 397 of THE JOURNAL, March 31, is a "formula for the prevention of diphtheria," which is: "an abundance of pure air, good water, wholesome food, clean soil and a clean personality." Have you not accidentally given the wrong formula? Very extensive observation of statistical and other reports on this subject seems to show that diphtheria is about as prevalent among those who employ this formula as among those who do not; while the statistics are conclusive in proving that under another formula the disease is preventable. On page 489 of THE JOURNAL, Oct. 15, 1887, is a diagram, which shows that in 102 outbreaks of diphtheria in which isolation or disinfection or both were neglected, there was an average of a little over sixteen cases and three deaths to the outbreak, that during the same time in 116 outbreaks in which isolation and disinfection were both enforced, there were only about one-fifth as many cases and deaths, which seems to prove that there was a saving of about four-fifths of the cases and deaths by thorough isolation and disinfection. The correct formula for the prevention of diphtheria would seem to be *isolation and disinfection.* Very respectfully,

HENRY B. BAKER, M.D.

Lansing, Mich., April 2, 1888.

A CORRECTION.

Dear Sir:—By some unintentional error, I find the article on "Methods of Examination of Bacteria for Laboratory Purposes" in Vol. X, No. 13, (March 31, 1888), ascribed to me, whereas the author is George W. Nash, M.D., of Boston.

Very truly,

SAMUEL N. NELSON, M.D.

Boston, April 4, 1888.

STATE MEDICINE.

SANITARY PRECAUTIONS IN PENNSYLVANIA.

To all Local Boards of Health and Borough Councils in Pennsylvania:—This Board has received official information since the first of the year of the existence of small-pox in nine States of the Union. Two outbreaks have occurred in this State. The State Board of Health of California has declared it epidemic in that State.

It is raging with great virulence in the neighboring island of Cuba, where sanitary precautions appear to be extremely lax, and with which we are in constant communication. It has prevailed extensively during all the past winter in portions of Great Britain.

In the neighboring State of Delaware cases exist, and several deaths have occurred as the result of the importation of infected rags. This Board therefore deems it its duty to urge upon all municipal and sanitary authorities the importance, First: Of doing all in their power to promote vaccination in their respective communities; and Secondly: Of keeping all new comers and returned travellers, and especially all immigrants, under observation for fourteen days after their arrival, in order that should symptoms of this disease manifest themselves steps may be taken to circumscribe and isolate the centre of infection with the least possible delay.

By order of the Board,

BENJAMIN LEE, Sec'y.

Philadelphia, March 15, 1888.

BOOK REVIEWS.

DISEASES OF THE HEART AND CIRCULATION IN INFANCY AND ADOLESCENCE. By JOHN M. KEATING, M.D., etc., and WILLIAM A. EDWARDS, M.D., etc. Illustrated with Photographs and Wood Engravings 8vo, pp. 215. Philadelphia: P. Blakiston, Son & Co. 1888. Chicago: W. T. Keener.

This work appeared in instalments in the *Archives of Pediatrics*, prior to its issue in book form. The authors have made an excellent systematic work

upon the heart with especial reference to its diseases as they occur in infancy and childhood. Modern periodical literature has been most carefully culled, so that we find in this work a synopsis of the most recent researches into the pathology and therapeutics of the heart. Its contents are embraced in ten chapters which describe the following subjects: Methods of Study; Instruments; Fœtal Circulation; Congenital Diseases; Malformations; Cyanosis; Acute, Chronic and Ulcerative Endocarditis; Acute and Chronic Pericarditis; Treatment of Endo- and Pericarditis; Paracentesis Pericardium; Hydro-pericardium; Hæmo-pericardium; Pneumo-pericardium; Myocarditis; Tumors, New Growths and Parasites; Valvular Disease; General Diagnosis, Prognosis, and Treatment of Valvular Disease; Cardiac Neurosis; Angina Pectoris; Exophthalmic Goitre; Diseases of the Blood, Plethora, Anæmia, Chlorosis, Pernicious Anæmia, Lukæmia, Hodgkins' Disease, Hæmophilia, Thrombosis, and Embolism.

The work deserves commendation as an excellent treatise upon its subject. We were surprised to find the blunt statement made, that the authors had "never derived any appreciable benefit from convalaria in any way whatever, and indeed it seems that the drug merits no place in our consideration." Unfortunately it is true that the preparations are so often variable in strength that they are not always reliable, but certainly from good preparations "appreciable benefit" can be obtained. They also, from their own experience, doubt the tendency of digitalis to accumulate in the system and produce suddenly toxic effects.

Two photographic illustrations of hearts with mitral valvular lesions have been introduced into the work. The photographs are very well made, but as is so apt to be the case where pathological specimens are thus depicted, the detail is so obscure that the illustrations are not very instructive.

MISCELLANEOUS.

RUSH MONUMENT COMMITTEE.—The Rush Monument Committee will meet at Cincinnati during the meeting of the American Medical Association. The hour and place of meeting will be announced from the platform on the first day of the meeting.
GEORGE H. ROHE, Secretary.

HON. MARSHALL D. EWELL, LL.D., one of the Faculty of the Union College of Law in this city, has been appointed Lecturer upon Medical Jurisprudence in the Law School of Cornell University for the next college year. This does not sever his official relations to the Union College of Law, in which he will still give his usual courses of instruction.

HEALTH OF MICHIGAN FOR MARCH, 1888.—For the month of March, 1888, compared with the preceding month, the reports indicate that tonsillitis increased, and that remittent fever and bronchitis decreased in prevalence. Compared with the preceding month the temperature for the month of March, 1888, was higher, the absolute humidity was slightly more, the relative humidity was slightly less, and the day and the night ozone were less. Compared with the average for the month of March in the nine years, 1879–1887, measles were more prevalent, and intermittent fever, diphtheria, consumption of lungs, remittent fever, pneumonia, whooping-cough, scarlet fever and inflammation of kidney were less prevalent in March, 1888.

For the month of March, 1888, compared with the average of corresponding months for the preceding nine years, 1879–1887, the temperature was slightly lower, the relative humidity was more, the absolute humidity and the day and the night ozone were less. Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of March, 1888, at twenty-five places, scarlet fever at thirty-three places, typhoid fever at thirteen places, measles at forty-nine places, and small-pox at one place.

Reports from all sources show diphtheria reported at fifteen places less, scarlet fever at twelve places less, typhoid fever at four places less, and measles at ten places more, in the month of March, 1888, than in the preceding month. Small-pox was reported present at one place, both in February and in March, but has now disappeared from the State.

THE CENTRAL KENTUCKY MEDICAL ASSOCIATION will meet at the Phœnix Hotel, Lexington, on Wednesday, April 18, 1888, at 10 o'clock, A.M.

MEDICAL ASSOCIATION OF THE DISTRICT OF COLUMBIA.—At the regular annual meeting, held on April 3, the following officers were elected for the ensuing year: W. W. Johnston, M.D., President; W. W. Godding, M.D., and C. W. Frazoni, M.D., Vice-Presidents; Geo. C. Ober, M.D., Secretary, and S. S. Adams, M.D., Treasurer.

GYNÆCOLOGICAL SOCIETY OF BOSTON.—At the annual meeting, held Jan. 12, 1888, the election of officers resulted as follows: Dr. H. C. White, President; Dr. A. P. Clarke, Vice-President; Dr. W. S. Brown, Treasurer; Dr. H. J. Harriman, Secretary; Drs. J. F. Frisbie, H. O. Marcy and E. C. Kellar, Committee on Admission; Drs. E. W. Cushing and I. W. Starbird, Committee on Pathology.

NEW BOOKS RECEIVED.

Physicians' and Students' Ready Reference Series. Obstetric Synopsis. By John S. Stewart. Illustrated. Philadelphia: F. H. Davis.

Transactions of the Academy of Medicine in Ireland, vol. v. Edited by W. Thomson.

The Year Book of Treatment for 1887. Philadelphia: Lea Brothers & Co.

The Prescription Therapeutically, Pharmaceutically and Grammatically Considered. By O. A. Wall. St. Louis: Aug. Gast.

The Surgical Diseases of the Genito-urinary Organs, including Syphilis. By E. L. Keyes. A Revision of Van Buren and Keyes' Text-book upon the same subject. New York: D. Appleton & Co.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT U. S. ARMY, FROM MARCH 31, 1888, TO APRIL 6, 1888.

Col. Jedediah H. Baxter, Chief Medical Purveyor; Major Chas. R. Greenleaf, Surgeon, detailed as members of an Army Retiring Board, appointed to meet at Washington, D. C., on Wednesday, April 4, 1888. S. O. 75, A. G. O., April 2, 1888.

Major Chas. H. Alden, Surgeon, will repair to Washington, D. C., on public business, and on completion thereof will return to his station, West Point, N. Y. S. O. 75, A. G. O., April 2, 1888.

Capt. Victor Biart, Asst. Surgeon, having been found incapacitated for active service by an Army Retiring Board, sick leave of absence is still further extended until further notice on account of disability. S. O. 77, A. G. O., April 4, 1888.

Capt. Edwin F. Gardner, Asst. Surgeon, leave of absence extended fourteen days. S. G. 77, A. G. O., April 4, 1888.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE HOSPITAL SERVICE FOR THE FOUR WEEKS ENDING APRIL 7, 1888.

P. A. Surgeon S. T. Armstrong, granted leave of absence for fourteen days. March 21, 1888.

P. A. Surgeon W. D. Bratton, promoted and appointed P. A. Surgeon from April 6, 1888. April 2, 1888.